APEC ICER

THE 12th APEC-KHON KAEN INTERNATIONAL SYMPOSIUM

"Innovation of Mathematics Education through Lesson Study
Textbook Development for SDGs,STEM, and Energy by Cross-border Education"

THE 10th INTERNATIONAL CONFERENCE ON EDUCATIONAL RESEARCH

"Challenging Education for Future Change"

FACULTY OF EDUCATION
KHON KAEN UNIVERSITY | THAILAND

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Rationale

People around the world inevitably face the influence of globalization. Their value and the way of life would be challenged. Education could be one solution for providing citizens to survive with knowledge and skills so that they are able to adjust appropriately to the changing world. To ensure the anticipated outcomes, challenging education and sustainable development seems to be a promising approach. Educators and stake holders, who involved in human resources development, may be enhanced learning community and challenging education for future change.

The goals of the ICER 2017 are to give international educators the opportunity to share ideas and form networks while working together on *challenging education for future change*. It is anticipated that the exchange of ideas and research findings will contribute greatly to future generations.

Sub-themes

1. Teacher Education and Professional Development
2. Curriculum and Instruction, Learning in classroom contexts
3. Educational Measurement and Evaluation
4. Educational Climate: *cultural and social context*
5. Educational management: *planning, policy implementation and assessment*
6. Lifelong Education: *non-formal and informal learning*
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Message from the Host

Greeting to all participants and welcome to Khon Kaen University

The International Conference on Educational Research (ICER) 2017 is the 10th annual conference to celebrate the 49th anniversary of the establishment of the Faculty of Education, Khon Kaen University (KKU). It is jointly organized by **Khon Kaen University** of Thailand, the **Education University of Hong Kong** of China, **State University of Surabaya** of Indonesia, **Mindanao State University-Iligan Institute of Technology** of Philippines, **Thailand Education Deans Council**, and the **Consortium of Sixteen Education Deans** of Thailand (Group 16). This year we are pleased to have the **Central University of Technology, Free State** of South Africa to join co-hosting the conference as our new university partner.

The goals of the ICER 2017 are to give international educators the opportunity to share ideas and form networks while working together on ***challenging education for future change***. It is anticipated that the exchange of ideas and research findings will contribute greatly to future generations.

During the ICER 2017 event, the APEC-Khon Kaen International Symposium 2017 with its theme "*Innovation of Mathematics Education through Lesson Study Textbook Development for SDGs, STEM, and Energy by Cross-border Education*", in collaboration with the **University of Tsukuba** of Japan and sponsored by the **Office of the Higher Education Commission** of Thailand, is also held at KKU starting from September 9 to September 12, 2017. So the two events will share the plenary sessions during the first two days of APEC symposium.

On behalf of the Faculty of Education, KKU, I would like to express my gratitude and my sincere appreciation to our co-host institutions, the guest speakers and the organizing committees for their efforts. I also would like to thank all delegations and participants who come from afar to join this event.

Associate Professor Maitree Inprasitha, Ph.D.
Dean, Faculty of Education
Director, Institute for Research and Development in Teaching Profession for ASEAN
Director, Center for Research in Mathematics Education
Khon Kaen University
Thailand

Message from Co-host

The Faculty of Education and Human Development is young faculty that aspires to contribute in meaningful ways to education development in the Asia Pacific Region. It is an integral part of The Education University of Hong Kong - a multidisciplinary education focussed institution with a strong research emphasis. The University has a growing international reputation for excellence in preparing globally aware professional educators, providing culturally enriched educational experiences, and producing research of distinction. Central to the University's values is a commitment to developing international and regional networks that will facilitate the integration of intercultural and global dimensions into its teaching, learning, and research.

At EdUHK we particularly value collaborative research with international partners. We seek to understand better the contexts that influence people in the Asia Pacific region and to identify ways of improving social outcomes for all. We see international partnerships as important opportunities for enhancing the impact of our research.

EdUHK is proud to join with Khon Kaen University to co-host the 2017 International Conference on Educational Research.

Professor Allan Walker
Joseph Lau Chair Professor of International Educational Leadership
Dean, Faculty of Education and Human Development
The Education University of Hong Kong
HONG KONG SAR
People's Republic of China

Message from Co-host

The College of Education of Mindanao State University-Iligan Institute of Technology (MSU-IIT) has been a partner of Khon Kaen University, Thailand in sponsoring the International Conference on Educational Research (ICER) in the recent years. In this 10th ICER on September 9-10, 2017, we renew such commitment to collaborate with Khon Kaen University in promoting educational research as instrument to disseminate scientific knowledge and competencies in the field of teaching and learning.

Nowadays, change in culture and technology happens constantly. These are challenging times for the educational institutions to be at the forefront of the changing socio-cultural landscape to guide peoples and communities towards a wholesome, productive and sustainable future. Collaboration as key to its attainment can be enhanced through an international gathering such as the ICER.

I am hopeful that in this yearly conference, the country delegates can attain deeper understanding of the 21st century educational thrusts. May they gain the greater passion to apply in various contexts the wisdom shared and learned in the sessions. Let me congratulate the Faculty of Education of Khon Kaen University for spearheading this conference. To the organizers, resource persons, facilitators, and paper presenters, may your presence inspire friendship with everyone.

Associate Professor Josefina M. Tabudlong, Ph.D.
Dean, College of Education
Mindanao State University-Iligan Institute of Technology
Mindanao, Philippines

Message from Co-host

Welcome to the International Conference on Educational Research (ICER) 2017: Challenging Education for Future Change which will be held during September 9 – 10, 2017 in Faculty of Education Khon Kaen University.

The ICER 2017 is the 10th annual conference with aims to provide an opportunity for both stakeholders, lecturers, students, and teachers to expand and enhance their knowledge and their vision for creating better education practice in each country. As education is a fundamental human right and is indispensable for each generation. Besides, through this conference wider networks will be formed, so it will ensure that each of us can contribute optimally for sustainable education in the future. Moreover, this is also in line with the vision of Universitas Negeri Surabaya which is excellent in education and strong in science.

As a co host of the International Conference on Educational Research (ICER) 2017, that the success of the conference depends ultimately to all of us who have supported our members of university to join the conference. In particular, we thank to Khon Khaen University in organizing the technical program; the Program Committee for their thorough and timely reviewing of the papers, and all committee who have helped us to for all participants. Recognition should go to the Local Organizing Committee members who have all worked extremely hard for the details of important aspects of the conference programs and seminar. Admittedly, thank you to the partners who jointly organize this great and extraordinary event.

Thank you to all participants of ICER 2017 who have spread as well as shared idea, insight and cooperation concern with a better world civilization through education. I believe by this conference togeteher we can create foundation of life with education and take part in realizing sustainable development goals (SDG) especially for quality education. So that we expect to get technical insight and tremendous opportunities for formal and informal networking which will be useful for every aspect of life.

Sujarwanto
Dean, Education Faculty
Universitas Negeri Surabaya
Indonesia

Message from Co-host

The Central University of Technology Vision 2020 statement is*: "By 2020, Central University of Technology, Free State shall be an engaged university that focuses on producing quality social and technological innovations for socio-economic development, primarily in the Central Region of South Africa"*. In other words, by 2020, CUT will be a centre of knowledge, innovation and excellence producing a critical mass of innovators that directly contributes to prosperity-creation.

In fulfilling the above said Vision, Central University of Technology (CUT), South Africa has realised that it's needs to strengthen its relations with international partners, especially institutions of higher learning, who not only share similar values and strategic objectives as CUT, but institutions who are committed in responding to international demands and challenges through the application of quality academic programme programmes, a knowledgeable teaching staff, cutting edge research, collaborative research initiatives, responsive community engagement projects, cultural exchange and regional and international partnership developmental endeavours.

We at CUT are therefore extremely proud to be a co-host to the 10th International Conference on Educational Research (ICER) 2017: *Challenging Education for Future Change*, which will be held during September 9-10, 2017 in the Faculty of Education, Khon Kaen University, Thailand. The Faculty of Humanities at CUT is further committed to support and strengthen MoU activities between Khon Kaen University and the Central University of Technology.

CUT further expresses its utmost gratitude to the ICER Local Organising Committee members, under the leadership of Prof. Dr Maitree Inprasitha for planning and overseeing the duties, arrangements and logistics for the upcoming event. I have no doubt that the other partner universities, attending ICER will also pledge their full support and commitment to the success of this international landmark event.

Professor Wendy Setlalentoa
Acting Dean, Faculty of Humanities
Central University of Technology
South Africa

Keynote
Address

Understanding the Realities and Complexities of a Transformed South African Schooling System: Considerations for Critical Multiculturalism

Gregory Alexander[1]
(*galexander@cut.ac.za*)
Central University of Technology, Free State, South Africa

ABSTRACT

Educational reform in post 1994 South Africa has been driven by overcoming apartheid, and the provision of equal educational opportunities for all citizens. The right to quality education for all is noted as a democratic right in which schooling is perceived as a public good and where teachers are viewed as the key agents of change. However, the recent incidences of perceived racism, human rights abuses, various forms of oppression and social justice impediments, seemingly prevalent in South African multicultural schools, appear to be counterproductive for teaching and learning, reconciliation and nation building. Contemporary scholars have called for a modification of traditional multicultural education toward a critical multiculturalism that seeks to alter the traditional learner-teacher power/social relations, nurtures an appreciation for an understanding of diversity; empowers learners to think critically about the world they live in and promotes democratic initiatives in the curriculum and pedagogy. Critical Multiculturalism may therefore serve as a vehicle for general and substantial education reform and may bring about new understanding and thinking in responding to the current realities and complexities observed in a changing South African schooling context- a context in which teachers, learners and the broader school community require more intricate knowledge, specialised skills and a renowned committed to quality education, equal learning opportunities and social justice. In this address, I deliberate on pertinent issues relating to certain realities and complexities of the South African schooling context. I attempt to unpack some notions attached to multicultural education and further argue for a critical multiculturalist perspective in responding to various issues, prevalent in the South African schooling context and how it could be effected towards the establishment of a sustainable, enabling teaching and learning environment focused on promoting critical engagement in a transformative education system.

Keywords: South African schooling system, Multicultural education, Critical multiculturalism

[1]Dr. Gregory Alexander is an associate professor in the Department of Postgraduate Studies in Education, Faculty of Humanities at the Central University of Technology. He holds Ph.D. in psychology of education. His teaching experience and areas of assigned specialization include the following: geography and social science teaching/ multi-cultural education/inclusive education/ school guidance & life skills education/motivational aspects on learning/ study skills / staff development/ school amalgamation / cultural diverse learning environments/ learning styles & self concept development & integrated school settings.

Taxonomy of Peace Perspectives and its relationship to political attitudes and personal wellbeing: Its implications to the development of Peace Education Curriculum and Initiatives

Imelu G. Mordeno[1]
(torres.markanthony@gmail.com)
Mindanao State University – Iligan Institute of Technology, Philippines

ABSTRACT

Perspectives of peace are influenced by culture, history, political context, and social condition. Numerous studies have attempted to understand both the universality and specificity of defining peace. Vast literature had offered and provided differentiated concepts of peace. However, to the author's knowledge, a combination of systematic (mixed qualitative and quantitative approaches), ideographic (i.e., coming from Moro, Lumad and Non-moro/lumad residents), and contextual (i.e., in a particular conflict area) approaches have yet to be explored. Utilizing a social constructivist view of which suggest that the definition and perspective of peace are a byproduct of how individuals experience the interactions they have with their social structure, environmental reality, current collective condition, and symbolic interaction, this study seeks to examine the potential multidimensionality of peace. There were two major phases of this study. First, the qualitative phase where the data collection was done through series of FGDs and interviews from the Moros, Lumad, and non-Moro/Lumad groups, and interviews with experts in the field. All the qualitative responses were transcribed, coded, and categorized. The second phase is the quantitative phase. From the coded responses, items were generated, underwent further refinement, translated, and administered in a scale format to Moro (n=414), Lumad (n=409) and Non-Moro/Lumad (n=402) respondents. After the completion of data cleaning and organization, a random split was conducted with half of each group. The first half underwent Exploratory Factor Analysis (EFA) while the second half was subjected to Confirmatory Factor Analysis (CFA). The results of the EFA were then confirmed using CFA. The results showed a peace definition model comprising of 10 factors: Respect of differences; Absence of conflict; Responsive and proactive governance; Sense of life satisfaction; Absence of armed conflict; Sense personal/inner peace; Responsible citizenship; Fairness and equality; Economic growth and stability; Unity amidst diversity, and; Good leadership. Further, the results also reveal that the 10 perspectives are significantly related to political attitude (i.e., support for compromise, political participation) and personal wellbeing (i.e., subjective happiness, optimism). The findings have important implications in the development of peace education curriculum and initiatives. The authors suggest that the 10 factors can be construed as curriculum objectives whereby class discussion and activities will be designed and implemented.

Keywords: peace, political attitudes, personal wellbeing, peace education

[1]Dr.Imelu G. Mordeno is a clinical psychologist, consultant, and academician. He earned his doctorate degree in Clinical Psychology from the University of Santo Tomas. He has served as a volunteer psychologist delivering immediate interventions to various major natural and man-made calamities. He has substantially helped in the development of school-based centers. He established the Center for Psychological Research and Practice of the Universidad de São José, in Macau, China. An expert on disaster preparation, trauma, resiliency, and other mental health-related issues and concerns, he has presented and published numerous papers on trauma, compassion fatigue, post-traumatic stress disorder (PTSD), growth and thriving. As a consultant he has worked on establishing centers and psychological clinics funded by international humanitarian agencies. He is currently a Professor at the College of Education in MSU-IIT.

Educational Curriculum Development for Improving the Quality of Student's Character in Indonesia

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ABSTRACT

Generally, curriculum is defined as a plan developed to facilities the teaching and learning process under the direction and guidance of school, college and its staff members. Curriculum is entire school program and all the people involved in it. Every school have to develop curriculum. For developing of curriculum based on principles namely flexibility, continuity, practicality/applicable, efficiently and effective. For developing curriculum can choose any models, there are (1) The Administrative Model, (2) The Grass roots Model, (3) Beauchamp's System Model, (4) The Demonstration Model, (5)Taba's Inverted Model, (6) Roger's Interpersonal Relations Model and (7) The Systematic Action-Research Model. For deciding one of the models depend on the kind and level of education, the way of Education (formal and non formal education) and the goal of curriculum development. School curriculum have to be developed for improving the quality of instructional process and student output, consist of hard skill and soft skill (affective/(character) domain. The indicator of characters are: honest, trusted**,** inspiring, fair minded, courageous, peace, simplicity, caring, responsible, cooperative, loyal, self-controlled, forgiveness, sharing, safety for all, respect others, encourage, self confidence, consistence, patient, discipline, love, togetherness, and simplicity. Curriculum must be the manual to conduct the instructional process for knowing the good, loving the good, Thinking and acting the good. So, the good behaviour of student can be habitual of mind, heart, and hands. The quality of student's character at Indonesia is necessary to be improved optimally, because many schools in Indonesia are often happened students conflict or student dispute among them, sexual insulting, lack respectful to their parents and teachers, violation of rule/value at school, bullying etc. So, for solving those problems it is necessary to develop curriculum based on character that involve government, parent, student, school committee, and society.

Keywords : Educational Curriculum, Student's Character

[1]Dr. Yatim Riyanto, M.Pd. is the 57th Professor at the State University of Surabaya. He holds doctoral degree in curriculum development, master degree in educational technology, and bachelor degree in sosial studies. His teaching focus and research interest involve curriculum development and educational management in vocational schools, research methodology, and technology in learning. His publications on educational research methodology as well as the new paradigm of learning have been cited by a number of scholars.

Oral Presentation

The Results of Using Training Package to Develop Counseling Competencies for Peer Counselor of Loei Rajabhat University, Khon Kaen Education Center Students

Achara Nuntasri[1]
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Abstract

The purposes of this Quasi-Experimental Research were 1) to study the result of training package to develop counseling competencies for Peer Counselor 2) to compare the counseling competencies for Peer Counselor between experimental group and control group ,and 3) to study the students' attitudes on Peer Counselor.

The 60 research samples were the students whose used to learn the Guidance Psychology course at Loei Rajabhat University, Khon Kaen Education Center. The research samples were divided into experimental group 30 students and control group 30 students. The experimental group attends training with the training package to develop counseling competencies for Peer Counselor 2 hours per times, for 15 times. Control group didn't attend training package to develop counseling competencies for Peer Counselor but studied in class.

The research instruments consisted of 1) a training package to develop counseling competencies for Peer Counselor 2) the counseling knowledge test with the reliability coefficient =0.84 3)Assessment form of counseling skills 4) Attitude scale for Peer Counselor. The collected data were analyzed to obtain mean, standard deviation and t-test independent.

The research finding were showed that after training with training package to develop counseling competencies for Peer Counselor, the experimental group gained higher score of counseling competencies ($\overline{X}$ = 72.66, S.D.= 3.46) than the control group ($\overline{X}$ = 46.93 , S.D.= 7.22) with the statistical significance at 0.5 level. Besides, it was clearly found that students' attitudes on peer counselor are in high level.

Keywords: *Peer Counselor, Counseling Skills*

Introduction

As National Education Act of 1999 and 2nd additional reformed issue of 2002, focuses on educational management in general for improving the quality of life and provision the learners with the desirable qualities of being a good, skillful and happy person. Articles no. 6 states that educational management must to develop Thai people as a completed human being with body, soul, intellect, knowledge and virtue, ethic and living culture, as well living with others happily (National Education Board, 2002). The Educational Ministerial Regulations also determines appropriate behavioral characteristics for being good students and youths, and that is very important to education. Students must keep away from these disqualifications; namely skipping class, gamble, carrying arms or weapons, involving intoxicants or drugs, burglary or extortion, quarrel or physical assault, showing adulterous affair in public, prostitution, roam and gathering at night which cause troubles for themselves and others (Bureau of Academic Affairs and Educational Standard, 2008).

Current social situation is changing rapidly, both of economy and society, which affect direct and indirect to people's lifestyle of all ages. Social problems are intensified at every moment,

[1]*Lecturer, Psychology&Guidance Program, Faculty of Education, Loei Rajabhat University, Thailand.*

such as epicurean values, imitation, spreading of narcotic substances, crimes, abortion, suicide, mental susceptibility. These problems are occurred when people do not know enough themselves and the environment, lack of decision-making skills and cannot adapt in various situations. (Department of Academic Affairs, 2002)

In addition, there is some information on the lives of children and youths who concerned in many aspects. According to study on the situation of children and youths in 2004-2005, the provincial children and youths monitoring program found that children from primary to high school, age between 6-25 years were more likely to play gamble; 60 % of playing card, 23% of sports and football, 8% of legal and illegal lottery, and 9% of others gambling. While primary and secondary students who skipped class at least once a week was 39%. There were students who have been extorted money or physical harmed in their school about 10%. Many children had unsuitable sexual action for their age, i.e. spending most of time for watching hentai, VCD porn movies or pornographic websites, etc. Sexual intercourse has also been found in some of them, and there were many youths under 19 years who got abortion, too. Especially, young people under 25 years tried to suicide no less than ratio 30:100,000 populations or approximately 14.48 people/day were revealed. After consideration of environment in their families and societies found that most children did not live with parents, they spent a lot of time for talking by phone, watching TV and surfing the internet. Friends have great role to children and youth. It reported that children spent average 2 hours a day at friend's house, which is more than spending time of reading book, usually just 70-80 minutes. Consequently, these problems affected to physical and mental health of children and youth. (Office of the Basic Education Commission, 2008)

According to data survey from Bangkok Research Center, Bangkok University Research Institute by sampling people aged of 15-22 years who lived in Bangkok and Perimeter, and major province in each region of Thailand, namely Chiang Mai, Ubonratchathani, Chanthaburi and Songkla, totally 1,850 people (male 44.1%, female 55.9) found that friends are the first counselor when youth faced distress or unease 30.9%, followed by parents, relatives and teachers respectively (Sunisa Pravichai , 2009), it showed that friends have the most important role for youth and consisted with Phanom Ketman (2013) who said that acceptance from friends will help them feel being secure and self-esteem. Young people are satisfied and proud of being accepted by their friends and others, this will make them feel self-worth and helpful.

The main mission of a student is educational achievement. However, the current status of education in higher educational institutions found that many students have dropped out or became a terminated- student status due to the under-graded criteria performance of the institution. Someone even graduated, but their performances are in low rank. So, the opportunity to be considered as employee is minimal, too. This condition may be caused by the student's learning behavior (Somsak Seedakulrit, 2010). Researchers who are advisors and have opportunity to provide counseling demonstrated the problems such as, low grade school-record, adaptation with friends, adulterous affairs and dropping out. These problems are obstacles to success. And as students 'inquiries found they mostly seek counseling from their peers first when they are unease than teacher, just because they are closer and easy to consult. Corresponding to research of Mc. Douglas (1981, mentioned in Pojachaman Duangtham, 1996) that compared study of effectiveness in counseling by peers and counseling by instructors on attitude of students toward university and rate of resignation. Experimental group is 8 first-year students, the counselors will be trained in basic skills of counseling, and the experiment takes 1 semester. The result revealed that the experimental group who received counseling from seniors had higher learning score outcomes than those who received from instructors statistically significant. In addition, they also had better attitude toward study and number of resignation was decreased.

Therefore, to prevent these problems, researcher is interested in developing the students of Loei Rajabhat University, Khon Kaen Education Center to be "Peer Counselor", it refers to a student who has been selected for training in specific skills to act role of helping others in the same age, able to exchange experience and lifestyle to advisees. Working is limited by basic job tasks in specific skills that have been trained. The problems that will be assisted are common problems, not serious ones. A counselor only just prevent before the problem is aggravated.

Peer counseling is a method to help each other friends, counselor must be trained in basic counseling skills to be able to assist their peers. The role of peer counselor is not only helping the others to comprehend the problems clearly and guidance solution to solve the problems, but also exchange experiences with each others and strengthen relationship between friends as well. Because the exchange of opinions and experiences of two parties is similar, relationship and intimacy are consequently quite good. In accordance with Erikson (1968)'s idea that interpersonal relationship between friends will strengthen self-development because they have opportunities to find their own interests and thoughts. Being in a peer group also allows them to learn how to interact with others and control their behavior. This accorded with a case study of solving problem by students at Heritage Specialist Maths and Computing College who attended in peer mentoring program: A personal journey. Students at same age provided counseling to help friends with socializing behavioral problems and learning problems. The study found those students who attended peer counseling program had improvement of learning (Teacher TV, 2013).

In consequence, the researcher is interested to study the result of training package to develop counseling competencies for Peer Counselor, to use their knowledge for helping friends who are unease. And it is also the method to strengthen students for helping each others correctly, and then social problems will be decreased. They can also apply their counseling skills for living, too.

Research Objectives

1. To study the result of using training package to develop counseling competencies for Peer Counselor of Loei Rajabhat University, Khon Kaen Educational Center.
2. To compare the result of development competencies for Peer Counselors in experimental group and the control group.
3. To study students' attitudes toward counseling.

Research Hypothesis

1. After experiment, students who attended the training package to develop counseling competencies for Peer Counselor had more score of counseling skills than pre-experiment at .05 statistically significant.
2. Experimental group had more score of counseling skills for Peer Counselors than control group.
3. After experiment, attitudes of students who attended the training package to develop counseling competencies for Peer Counselor were in high level.

Research Methodology

Research design

This research is a Quasi-Experimental research with nonrandomized control group pre-test post-test design (Phuangrat Taweerat, 1997)

E	T_1	X	T_2
C	T_1	~X	T_2

Symbols are defined as following;

E as experimental group
C as control group
T_1 as pre-test experiment
T_2 as post-test experiment
X as training package to develop counseling competencies for Peer Counselor
~X as usual learning in class

Target group

60 students of Loei Rajabhat University, Khon Kaen Education Center who are studying in the first semester of academic year 2014, divided into two groups: experimental group and control group, consist of 30 students in each. The process of selection as below,

1. Researcher recruited 60 students following the criteria of qualification; such as volunteer spirit, sincerity, intention to help others and being a good listener.
2. Target group students assessed their counseling skills (pre-test)
3. Put students' scores in ascending order all of 60 students and matching in two groups using Matched-Groups Design to obtain the most similar mean scores.

Instruments and data-collecting procedures

The instruments and data-collecting procedures were as follows:

1. Required authorization from Loei Rajabhat University for collection of data.
2. Recruited 60 students who are studying in the first semester of academic year 2014, following qualification; such as volunteer spirit, sincerity, intention to help others and being a good listener.
3. 60 selected-students performed the pre-test. Then, the scores were ranked in ascending order into two groups with sample random sampling as experimental group and control group, each group consist of 30 students.
4. Students of experimental group and control group assessed individually for their ability of counseling skills (pre-test), researcher is an assessor.
5. Students of experimental group are trained with a training package to develop counseling competencies for Peer Counselor for 15 times, 2 hours per time. The researcher is a lecturer.
6. After completion of training, researcher scheduled an appointment for students of experimental group and control group to individual counseling test. Volunteers who will be advisees were already prepared. Experimental group and control groups acted as counselors. Researcher is the assessor who records in counseling assessment form.
7. At the end of experiment, students of experimental group and control group performed the post-test, and then experimental group performed test of attitude toward counseling.
8. Collected data was used for statistical analysis.

The Statistics Used for Data Analysis

Statistics for analyzing quality of research tools are as follows;

1. Analyzed the accuracy in content validity of counseling assessment scales with presenting of Item-Objective Congruence (IOC) to verify consistency between the assessment and definitions.

2. Analyzed quality of counseling assessment form with reliability, using Coefficient Alpha (Phuangrat Taweerat, 1997)

$$\alpha = \frac{K}{K-1}\left(1 - \frac{\sum S_i^2}{S_t^2}\right)$$

α = Reliability score of counseling

$\sum S_i^2$ = Sum of variances of score in counseling skill measurement by individual

S_t^2 = Total variances of counseling skill measurement

K = Quantity of testlets in counseling skill measurement

Researcher analyzed collected data from statistics to analyze data of experiment following objectives as below;

1. Finding Mean ($\overline{X}$) and Standard Deviation of scores from counseling skill measurement.

2. Finding score of counseling skill assessment by basic statistic with Mean ($\overline{X}$) and Standard Deviation (S.D.).

3. Comparing the differences in counseling skill scores after experiment of experimental group by t-test with dependent sampling design.

4. Comparing the differences in counseling skill scores after experiment between experimental group and control group by t-test with independent sampling design.

5. Finding Mean ($\overline{X}$) and Standard Deviation (S.D.) of experimental group from measurement of attitudes toward counseling.

Research Results:

Table 1 Comparison of differences in counseling skill scores of pre-test and post-test in experimental group

Scores	**n**	$\overline{X}$	*S.D.*	*t*	*p*
Pre-test	30	28.77	4.981	44.188	.000
Post-test	30	72.67	3.467		

*p < .05

Table 1 shown that experimental group had counseling skill score higher than pre-test at .05 statistically significant. This demonstrated that training package to develop counseling competencies for Peer Counselor can develop and improve their knowledge and skill of counseling.

Table 2 Comparison of differences in counseling skill scores of post-test between experimental group and control group

Target Group	n	$\overline{X}$	*S.D.*	*t*	*p*
Experimental group	30	72.67	3.467	17.578	.000
Control group	30	46.93	7.230		

*p < .05

Table 2 found that scores of counseling skills in experimental group was higher than control group at .05 statistically significant.

Table 3 Attitudes toward counseling of experimental group using basic statistic with Mean ($\overline{X}$) and Standard Deviation (S.D.) (n=30)

Statement	$\overline{X}$	S.D.	Meaning
Feeling of being a peer counselor			
1. I am delighted and willing to be a peer counselor.	4.03	0.71	high level
2. Although counseling is difficult and have to accommodate people's emotions, but I am ready and willing to do it.	4.90	0.30	high level
3. I am discouraged when advisees do not cooperate in providing the data as they should do.	4.56	0.72	high level
4. Counseling is assisting a friend by talking with purpose and procedure.	4.56	0.62	high level
5. I understand that being a good counselor needs to learn human's mind and train myself more.	4.50	0.50	high level
Total/Average	4.51	0.57	high level
Useful of counseling			
6. Although counseling cannot find out the solution for everyone, but I always think this method is very useful.	4.16	0.59	high level
7. I believe that counseling can help friends to be mentally healthy.	4.96	0.18	high level
8. I believe that counseling can help friends to have self- awareness and self-realization.	4.16	0.37	high level
9. Helping friends and other students is good because they dare to open their minds with peers rather than adults.	4.53	0.62	high level
10. When I see others are unease. I will help them immediately.	4.53	0.57	high level
Total/Average	4.47	0.47	high level
Awareness of counseling			
11. Counseling is worthy for human beings.	4.40	0.56	high level
12. Counseling is hard, and useless for peer counselor.	4.36	0.61	high level
13. Counseling can help friends to find solution and solve the problems by themselves.	4.46	0.68	high level

14. When my friends are unease or uncomfortable. I am glad to help them as well.	4.46	0.62	high level
15. Being a counselor is a part of reducing youth problems.	4.80	0.40	high level
Total/ Average	4.50	0.57	high level
Totally/Average	**4.49**	**0.53**	**high level**

Result of data analysis in table 3 found that attitudes to counseling of post-test in experimental group was high level ($\overline{X}$ = 4.49 and S.D. = 0.53), aspect of attitude in high level were *feeling of being peer counselor* with ($\overline{X}$ = 4.51 and S.D.= 0.57), followed by *awareness of counseling* with ($\overline{X}$ = 4.50 and S.D. = 0.57), then *useful of counseling* with ($\overline{X}$ = 4.47 and S.D. = 0.47) respectively.

Research Discussion :

This research aim to study the result of using training package to develop counseling competencies for Peer Counselor of students in Loei Rajabhat University, Khon Kaen Education Center. Researcher proposed the discussion of reasearch hypothesis as below:

Hypothesis 1: After the experiment of students who attended the training package to develop counseling competencies for Peer Counselor found that counseling scores was higher than pre-test at .05 statistically significant, the result was matching with hypothesis and consistent with research of Phatsaraporn Kinchapo (2004) who studied about development of counseling skills for young backbones in Nakhon Ratchasima Province. Experimental group was 10 high school students who have been trained in program of leading teenagers in year 2003 and with normal emotional intelligence level. The result showed that after joining counseling development program, they had improvement of counseling in both of knowledge and skill at .01 statistically significant, and in accordance with Chanthima Thodsanit (2011) who studied the result of using the program to develop counseling skills for peer counselors. The research results were as follows: 1) After experiment, peer counselors had higher scores of counseling than pre-test at .01 statistically significant. 2) Peer counselors had scores of counseling higher than before attending in the program at .01statistically significant

After the training with training package to develop counseling competencies for Peer Counselor, experimental group was improved in scores. That means during training, the students can observe from demonstration, role play and self-action, all of these are efficient because the students can learn step by step which similar to real life experience. Each training activities will focus on skills and the students who attended the training played role as the Peer Counselors who will advise friends with different problems. The training of counseling will motivate a great deal of comprehension in counseling. They also had the expertise to provide their counseling skills effectively.

Hypothesis 2: Experimental group had higher scores of counseling than control group, that was consistent with research of Rabiecki and Brabeck (1985) who studied the result of peer counselors toward an adaptation in the university. The sample group was 146 first-year students receiving advices from friends who have been trained in counselling skills. At the end of experiment, advisees were assessed. 92% of students found that their friends who were counselors can assist them for adaptation of living in the university, and 91% of student, after receiving advices from friend, they did not ask more for counseling from others organizations. They believed that friends can help most in social adaptation and whatever they are worried

about. In accordance with research of Daniels (1987) who studied the result of micro counseling training toward skills for communication of nursing students, divided randomly into two groups; experimental group and control group. Experimental group have been trained for counseling in 6 skills, the result showed that students of experimental group who have been trained for counseling have higher communicative skills than control group who did not attend the micro counseling training. And related to research of Wheaton, Granello and Haag (1998) who surveyed factors that effected to counseling skills of occupational counselors. The sample group was 180 occupational counsellors, using measurement MCI and the Marlone Crowne Social Desirability. The result revealed that training can increase skills for counseling, effecting in positive way on skill development, sensitivity to awareness, knowledge in counseling was increased, and counseling experience had positive effect to counseling relationship. It was also compatible with research of Achara Prakit (2011) who studied result of potential developing for peer counselors with group activity technique. Target group was 24 students of secondary school, divided as experimental group 12 students and control 12 students. Experimental group attended to program of potential developing for peer counselors with group activity technique for 15 times (3 times/week, 1 hour to 1.30 hours/time). The results showed that students who attended the program had higher potential scores in post-experiment than in pre-experiment, and experimental group also had higher potential scores for peer counselors than control group at .05 statistically significant. As research result, it presented that training package to develop counseling competencies for Peer Counselor can improve more knowledge and skill for counseling than pre-experiment, which means peer counselor received training experience in every skills, using role playing for most similarity to real life experience.

Hypothesis 3: After the experiment, students who have been trained for developing counseling skills for Peer Counselors had attitudes toward counseling in high level, consisted of 3 aspects: good feeling of being Peer Counselor, awareness on useful of counseling and appreciation on worth of counseling. That was to say thought trend, feelings and behaving trend of Peer Counselor toward counseling were increased after training, the result was as specified hypothesis, in accordance with research of Nisakorn Huanchit (2012) who studied on development of activity model for peer counselors in dormitory of Chiang Mai University. Sample group was 6 male peer counselors and 5 female peer counselors, mostly of peer counselors were 21 years (54.5%). The result showed that peer counselors have increasing manner scores of being counselor after training at .05 statistically significant. Also, consistent with research of Warakorn Sapwiraprakorn (2012) who studied on development of characteristic of youth counselor for students in boarding secondary school in Chonburi Province. The result showed that students who attended training were more improved increasingly in characteristic of youth counselor after training than before training. In conclusion, students have more knowledge and basic comprehension in peer counseling, interest in consulting, also improvement of proper personality for counseling than before training.

According to a student interview, “After the training, I always aware the importance of peer counseling. When my friends have the problems, they mostly come to talk with me than go to see instructor or teacher because they are afraid to ask for help. And if I am person who can help friends to solve the problems, I will be happy.” He said. This demonstrated that training package to develop counseling competencies for Peer Counselor motivated good attitude for being Peer Counselors. Because a Peer Counselor was not only help friends to understand problems clearly and developed guidance to solve problems, but also exchanged the experience and idea with each other.

Recommendation

Recommendation for using research result

The result found that after training with training package to develop counseling competencies for Peer Counselor, experimental group had more skill scores for counseling than control group. That was training package can improve both of knowledge and skill for counseling. Therefore, training package should be used to train skills for counseling in high school students or group of advisors, etc.

Recommendation for further research

1. Long-term follow up should be monitored for durability of counseling skills.
2. Counseling skills should be followed up and assessed periodically on development of ability for counseling and durability of counseling skills. There should be also the group discussion for reflection the results of counseling of participants if they have any difficulty or barriers for being as peer counselors.
3. Attitudes should be assessed for being as counselor after 2 months of training for follow up changes of participants' behaving trend toward being as Peer Counselors.

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The Improvement of Indonesian Languange Learning Outcomes for Hearing Impairment Students in Special School Through Maternal Reflective Method

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Abstract
The purpose of this research is to describe the (1) the implementation of Maternal Reflective Method, (2) activity after using of Maternal Reflective Method, and (3) improvement of learning outcomes after using the Maternal Reflective Method in teaching and learning Indonesian Language activities for hearing impairment students. This research used classroom action research design. The procedures applied in this research are planning, implementation, observation and reflection. If the problem is not resolved yet, this research will be conducted again. The data was collected through observation and testing techniques. This research was conducted in two cycles. In the first cycle, the result is not successful since the criteria of success indicators are not fulfilled. The indicator success in this research should obtain by minimum the average grade 70% and minimum classical completeness grade is 80. By achieving those grades means that this research has been successful. The students will achieve and or mastery the topic of learning is influenced by the activities of students in learning Indonesian Language. It can be concluded that the technique of Maternal Reflective Method could be applied and improved for the students in special school.
Keywords: Language Skill, Learning Outcomes, Maternal Reflective Method

Introduction

In the National Constitution of 1945 section 31 verse 1 states that "Every citizen shall have the right to education". According to the Law of 2003 chapter IV section 1 that “Every citizen has the same right to get a quality education" It is also written on section 2 which states "Citizens who have physical disabilities, emotional, mental, intellectual and social disorder entitle to special education. This indicates that students with hearing impairment have same opportunity like other students in education.

Hearing impairment can be defined as a condition of hearing loss that causes a person cannot capture various stimuli, especially through the sense of hearing. For this problem hearing impairment students have limitation in language development and speech as well as communication to other. The fact of hearing impairment students may not hear the sound, it makes them not understand the language spoken that used by others and it affects to their inability to talk so that they need to be trained. This inability is a characteristic that makes them are different from other students. Students with hearing impairment more difficult to capture the sound of language than normal students, another problem which is also important is in reading. If they could not read it well and do not try to comprehend the text given, they

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will not solve problem in reading. Daniel Ling is a special education professional in specializing hearing loss (in Wati, 2013: 1) said that "Deafness gives a serious impact suffered by the person who has this problem that is language disorder.

Various methods have been used by teachers to teach the students in order to ask them to have ability to read and write optimally. It is starting with the names of people around them, the objects or things', animals' and name of plants. They have to recognize the vocabularies given and try to learn it in reading and or in writing. However they have not shown significant results.

Generally, one of the problems faced for the students with hearing impairment is in expressing their language both in oral and in writing. Their sentence is not arranged systematically. In reading, they could not memorize the content of the text well. For the short text, they could understand it however they could not capture or memorize the long text or even textbooks. If the teacher does not notice their didactic, the students do not reach their reading skill. And also in answering written test questions and oral or when they have to try make up stories. It proves that teachers should apply a new method that appropriate in order to develop the teaching learning activities in the classroom for teaching language.

One way to help them is "Conversation". If the teacher from the beginning holds a conversation with the students, so the exchange of their ideas will be wider. Therefore hearing impairment student especially is an observer, which means in the conversation they always look at the opponents' speaker lip but it is not supported by spoken language. It starts from heart-to-heart conversations to an understanding of flexibly language including learning to reading and guiding students to find their own rules of language. The first situation of hearing impairment students perform a conversation in the strict sense that refer to the first language or mother tongue in which person learns informally in childhood and typically occurs for mother's role.

Mastery of the mother tongue, marked by an automation or reflex, hereinafter called Maternal Reflective. Maternal reflective is a method of language learning that focuses on conversation, producing sentence, self-disclosure (self-experience), listening, reading and writing, which is called Maternal Reflective Method (MRM). Maternal Reflective Method is one of the right methods to improve language skill of hearing impairment student. Language learning with the Maternal Reflective method involves a free heart-to-heart conversation (a conversation that comes from the feeling expression of the heart and is not influenced by anyone), a heart-to-heart conversation with a kind of progressive information (conversation begins with information, fact-giving, sharing of a student, two, or three or may come from a teacher about an experience that occurs personally with knowledge), reading and writing. Understanding language with this method provides advantages over other language learning methods, which prefer conversations, so that hearing impairment student will use spoken language rather than sign language, shaping an attitude that care for others, understanding conversations of others, completing imperfect sentences or language used by others, developing the ability to compose sentences according to the structure or pattern of sentences correctly, and increasing conversation or language use skill.

Literature Review

Hearing impairment student has lack or loss of hearing ability whether mild to profound hearing loss, so he cannot use his sense of hearing in his daily life that affect to the whole life.

To identify students who has hearing impairment as Rani Wulandari (2013:13-14) notes that they are unable to hear, delayed in language development, often to use sign in communicating, less response or unable to respond while we are talking with them, unclear in

speaking, having monotone or unfamiliar voice, leaning their head to hear the voice, having more attention on vibrating, having ear problem which pus come out from both of their ear, having ear defect.

According to Bunawan and Caecilia (2000:89), Reflective Method is a method that combines daily conversation language and grammatical rule teaching. Maternal Reflective Method is one of learning method that teacher need to know student behavior and to be aware of what the student express so the teacher can encourage student to be brave telling a topic about themselves by giving a clue and question using proper and systematic language. Through that the teacher asks all students to involve in conversation and create condition so they will respond by giving any comment in the topic. Then teacher make conversation visualization.

Procedure

This research is a classroom action research design, which is implemented on Indonesian Language subjects to improve student activity and student learning outcomes through the Maternal Reflective Method. According to Akbar (2009: 26) states that classroom action research is a controlled investigative process to find and solve classroom learning problems which is cyclical to improve the outcome and quality of learning in a particular class.

The research subject is students with hearing impairment grade IV in a special school which has total of 4 children including 1 male and 3 female. This research was conducted at a special school Sariwiyata on Jalan Imam Bonjol 04 Beru, Wlingi in Blitar.

The data is obtained from teachers and students. We take some observations, tests, and documentations as techniques to get data. The intended observation is to know the student activity in learning and the teacher success level in teaching by using Maternal Reflective Method. The instruments used are observation sheets and test questions as the evaluation after the lesson is given. Therefore at the end of each cycle, test is given to evaluate the learning process.

The procedures of this research include planning, implementation, observation and reflection. Data analyses used in this research are descriptive quantitative and qualitative data analysis techniques. Data are analyzed descriptively to see the trend that occurs in learning activities. Quantitative analysis in this research is conducted on student learning outcomes about the route map of a place. The mean of students test as the learning outcome is also analyzed to be categorized as complete or incomplete classification. Qualitative analysis in this research is conducted to get the results of student as the assessment from the teacher in learning activities about the route map of a place.

The successfulness indicator in this research is the students should obtain 75% as the minimum average grade and 80% as the minimum classical completeness grade. The classical completeness grade for elementary 4 in special school is 70. The Students are mastering Indonesian language lesson when they could reach 70.

Findings/Analysis

In the first cycle, the result of students were higher than the result that they have gotten from pre test. The pre test result showed that the average grade is 46,25 or 25% of student could complete it by reaching to be 56,25. Although the total students who reach the minimum completeness standard were the same, actually they were getting different marks and it is showing the increasement. The average grade of students activity is 42,72.

In the second cycle, the result of students activity and learning were also showed the improvement from the first cycle. In the first cycle showed that there were 3 students or 75 %

who were not complete. While in the second cycle, there were 4 students or 100% who were reaching the completeness. Students activity in the second cycle showed significant progress by getting the average grade is 94,80.

The implementation Maternal Reflective Method to Improve Indonesian Language Learning Outcome for Hearing Impairment Student in Special School Sariwiyata Wlingi Blitar

The implementation of Indonesian language learning through Maternal Reflective Methods wants to emphasize the conversation learning activity. The problem is the students were not interested in Indonesian language subject, especially to the activity that involve the logical thinking and conversation as well as writing. Therefore, we build an effort to solve the problem. This training was conducting in second cycle which each cycle consist two meetings.

In this training the teacher applied the method that used half circle sit position and the teacher is in the middle. The students started with heart to heart conversation and the teacher gave any respond followed to write some word in the conversation on the board.

In first cycle is found the fact that to explain the material to hearing impairment students in learning we need “face to face” with the students, interact with the students to encourage their enthusiasm. At the end of learning the teacher gave some supports about the material. In the same way Mungiarisih commented in Dwi Indri Oktaviani (2013:4) that some parts in learning use Maternal Reflective Method need to face with students, set the voice, build togetherness and happiness, respond student’s word, mimic, develop spontaneity, use reinforcement and motivate empathy.

Teacher started the main activity to explain the lesson. Before the teacher took the material, teacher would give asking and answering question using the heart to heart conversation freely but it refer to the topic about student experience on way to get his school and after that the other students give their response. At the first time they would be confuse and didn’t understand what the teacher meant because they could not figure it. Then when the teacher is explain and showed the colourful material with some pictures the students were understood the teacher explanation. Teacher still spoke in common language they usually used and they gave feedback in sign language. In this case as Rani Wulandari said (2013:13) that the characteristic of hearing impairment student is the individual who has difficulties to speak will tend to have problem in understanding the abstract concept, having trouble to hear, delay in the development of language, using sign language to communicate, lack of respond when somebody ask in conversation, having unclear speech, having monotone word, trying to hear by leaning the head on, having more attention on vibrating, produce pus from both his ears, having ear organ defect. That comment is relevant to what Hidayat in Renny (online) said that hearing impairment student characteristic in speech is poor in vocabularies, having difficulties to appreciate figurative forms such as metaphor, similes, parodies, analogies, limited in verbal or be passive in speaking.

The paper sheet evaluation is given after the teacher taught the lesson. The teacher considered to make the exercises that is appropriate with the cognitive and psychomotor aspect of the students. The word on exercises related to the word that used in their surroundings. That is relevant to the statement of Lani Bunawan and Caecilia Susila Yuwati (2000:88) states: It is not right when we give hearing impairment student exercise to arrange the sentences and any kind of language form without using it through their own experience.

The teachers found the similar fact in the first cycle of learning to the second cycle however there was significant improvement through the training using Maternal Reflective Methods. Then the teachers evaluated some problems found through observation and reflection in each cycle and next those were applied to increase the learning outcome.

Use of Maternal Reflective Method to Increas Activity Hearing Impairment Student Grade IV at Special School Sariwiyata Wlingi in Blitar.

According to constructivism learning theory, knowledge cannot be transferred from teacher mind to student. It means student must be mentally active to construct his knowledge structure following cognitive maturity that he has, especially in his conversation. However we need to know that hearing impairment student has lower cognitive level than normal student. It is caused by the level of hearing impairment student language ability lower because of the limited vocabulary. It is relevant to Diana Apriliani (2013: 16) statement that hearing impairment student cognitive development is influenced by the language development so the language disorder will affect intelligent development of hearing impairment student. By supporting of Soemantri in Renny (online) comment that generally intelligent hearing impairment student potentially same with normal student but functional development is influenced by language skill, information limitation and also abstraction power.

From student activity assessment that was done during research process, there was significant result which showed improvement in every treatment in each cycle. The aspects would be assessed from student activity sheet such as visual, conversation, listening, writing, and student emotional aspect. At the first time in first cycle hearing impairment student activity reached 150 and the average grade was 37,5. While at the second treatment had total of 191,69 and the average grade was 47,93. After that the teacher accumulated the total of first and second treatment was 170,85 and the average grade was 42,72. The grade outcome student activity in second cycle at first treatment was 358,34 and the average grade was 89,59. At second treatment got 400 and the average grade was 100. The last grade that got in second cycle reached 379,17 and the average grade was 94,80. Therefore Indonesian language learning using Maternal Reflective Method improve hearing impairment student learning outcome up to achieve standard of minimum completeness criteria that the school set.

Following the result of visual, listening, and verbal aspect in the first and the second cycle showed progress and it was proved by assessment through student activity observation that was explained on previous paragraph. At the first cycle student did not concentrated to the material that the teacher given even the other student who had been having conversation. Some student still was joking and they did not want to ask the question when face difficulty. It is caused the student still did not understand flow of learning and the condition seemed not conducive. In the same statement that Lani and Caecilia Susiala Yuwati (2000:28) tell about hearing impairment student has rigidity character which less flexibility to see the world and duties. The lack of language gives effect to world of thinking become narrow. Their mind and feeling is limited to concrete thing. They have difficulties to understand the relationship cause and effect in physic and social environment. However, in the second cycle their concentration and courage increased. It seemed that they are confident to ask for their difficulties.

The language is limited and simple used by hearing impairment student in conversation and writing aspect. It often happen that they say same words many times. In the same statement Heider in Luna Bunawan and Caecilia Susila Yuwati (2000:54) state about the hearing impairment student writing which is their sentence arranged shorter and simpler than normal students. Generally it looks that their writing is similar with the normal student writing who is younger.

In emotional aspect, hearing impairment student tend to be self centre. While they feel boring in the lesson, they would not continue and did not care for other duties. Ochamutz (online) comment about egocentric character of hearing impairment students that they have difficulties to put themselves in other feeling and thinking way, lack awareness or not having concern the effect of their attitude to others.

Improvement Indonesian Language Learning Outcome for Hearing Impairment Student grade 4 in special school Sariwiyata Blitar using Maternal Reflective Method.

Using Maternal Reflective Method in Indonesian language learning followed view of various language character theories that language is from interaction of linguistic, social and cognitive factor. Lani Bunawan and Caecilia Susila Yuwati comment that Maternal Reflective Method try to combine daily conversation in childhood with the structure or grammatical concept on language in learning. Ochamutz (online) also said that the limitation of speech and language use for hearing impairment student impact to their achievement in verbal and nonverbal lesson lower than normal student in the same age.

By Maternal Reflective Method will be able to improve student learning outcome through the observation in each cycle. Before getting treatment the student grade average 46,25 and increase to be 56,25 in the first cycle. However minimumm completeness standard is 70 with the class average 75% and the minimum completeness classical must be 80% so it will be success Indonesian Language learning. In first cycle there was 3 students of 4 total students were not complete or it was 75%. While in the second cycle the students reached the completeness of 100% with the total 360 and grade average is 90. The classical completeness show improvement from 25 % become 100% for the next second cycle of learning. The student outcome in second cycle reached the success because it covered minimum completeness criteria that is 70 and minimum completeness classical 80%.

Suggestion

The teacher is considering to give suggestion for:

1. **Headmaster**
   Headmaster should give evaluation in this condition and situation to improve the quality of learning method therefore it can support the implementation of innovative and creative learning for hearing impairment student in special school Sariwiyata Wlingi Blitar.
2. **Teachers**
   By experiencing the implementation Maternal Reflective Method it gives some ideas for teacher to develop learning model in the same topic of all subjects therefore it will help other teacher get some points. Although applying Maternal Reflective Method was exhausted for teachers however this method really develops the language use and speech of hearing impairment students therefore teacher need to keep using this method in every situation of learning.
3. **Other**
   Maternal Reflective method is one of the method to improve language use ability and vocabulary for hearing impairment students who has limited and simple vocabulary. This research can be developed to the next research related to this topic.

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School Leadership and School Effectiveness; Teachers and Student's in Madrasah At East Java

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A. Introduction

School effectiveness is very important to improve school for enhancing quality of school. School improvement concerns the raising of students' achievements and the school's ability to manage change (Reynolds *et al*. 2001). One can compare one's own school and individual performance against a set of benchmarks and criteria from the international literature on school effectiveness and school improvement.

In Indonesia, there are many school to be effectiveness, but there are to many school not be effective specially in madrasah school. For example the school effectiveness have characteristic there are *Leadership at all levels*: strong, purposeful, adoption of more than one style, *Management and organisation*: clear, simple, flatter structures, *Collective self-review*: involving all staff and leading to developing new practices, *Staff development*: systematic and involving collective and individual needs. *Teaching and learning*: creative debate amongst teachers and curricula and pedagogy, and *Parental involvement*: parents as partners in education

One characteristic is leadership, school leadership has been identified in the last few years in several international reports and as a key function to assuring quality in education. Research on the subject of leadership has increased and has focused on analysis of the leader as a person and on leadership functions and tasks. Furthermore, it has been stressed in studies that school leadership can be the solution to many problems arising in schools (Bolívar *et al*., 2013).

It is a complex concept, which cannot be understood or applied in a single way and which is defined in terms of a demanding set of functions that include financial administration, human resources management and leadership for learning (Pont *et. al*. 2008). School leadership is basically underpinned by two conceptual features (Spillane *et al*., 2010). The first concerns the individual's personality, style and ability; the second links leadership to forms of organization and, to a smaller extent, to individual practices.
School leadership has historically been connected with the role and functions of school-management teams (Schleicher, 2012). During the last decade, however, it has been stressed both in reports by international organizations and in academic works that leadership involves a common culture of expectations, in which everyone is accountable for individual contributions to the collective outcome (Leithwood and Louis, 2011).

The idea of organizing schools as learning organizations where the practices allow for continuous learning israpidly and steadily considered as the mediator for achieving school improvement (Silins and Mulford, 2002).The school is gradually transformed into a learning organization which needs to refresh the processes involving its current and future needs (Huber, 2004). A great deal of research on factors promoting teacher effectiveness has been conducted by educational scholars. Leadership practices seem to have quite positive effects on teacher's

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lifelong professional development in the school context (Flores 2007) because they have the potential to empower teachers towards a commitment to change and enhance their learning in school organization (Bogler, 2001;Fullan, 2002; Day et al, 2001).

Leadership, in whichever model it embraces, has as central goal to ensure and maintain the school improvement which has to do with the quality of teaching; the most influential factor of students' achievement. It is obvious though that the quality and the effectiveness of leadership is understood and evaluated in correspondence with regards to teachers' motivation and effectiveness (Fullan, 2001). According to recent research, one of the main leadership practices has to do with the teacher's empowerment which is strongly related to the central goal of the school; students' learning. The improvement of the employees' performance is a significantly important aim which the leader tries to achieve through several actions taking into consideration individuals' beliefs, values, motivations and skills (Leithwood, 2006). Structuring a specific vision and giving directions, they provide teachers with a strong motivation to improve their performance. In particular, setting a shared purpose that clarifies the roles, the objectives and the desired expectations from the teachers' performance they enhance teachers' effectiveness in the classroom.

Our purpose in this paper is to reach of the main leadership practices that contribute to school teachers' and student effectiveness.

B. Literature review

Clearly one has to be extremely cautious in understanding and approaching the concept of school effectiveness. It is not a unitary concept; rather it is complex, multi-dimensional, and not reducible to single or simple measures. What is clear is that *teacher effectiveness* plays a very considerable part in school effectiveness. Further, the provision of checklists of characteristics of effective schools is often accompanied in the literature by caveats against simplistic benchmarking; the problem is one of *process*, of support, of changing individual teachers, not of producing or emulating checklists.

Drawing together the several features of effective schools outlined so far, a common core of features emerges, indicating overall characteristics of effective schools. It would be useful, perhaps, for principals and schools to identify where they stand in relation to the factors indicated.
Teachers and teaching
High teacher expectations
Effective classroom management
Teachers as positive role models
Positive feedback to, and treatment of, students
A relevant but orderly and firm classroom atmosphere
Suitable and stimulating physical environment
Consistency amongst teachers, e.g. expectations, behaviour, planning
Structured teaching sessions; a concentration on teaching and learning
Intellectually challenging teaching and a work-centred environment
Monitoring progress and record keeping
Curriculum
A well-planned curriculum

Clear aims and objectives translated into classroom practice
An emphasis on high academic standards
Effectively deployed resources
Management
Good working conditions for staff and students
Effective leadership by senior and middle managers
The capability to identify and solve problems
Capability to manage change and development
Teacher involvement in decision-making
Climate of respect between all participants/stakeholders
A positive climate in the school
Clear, simple, flat structures
Shared vision and goals
Leadership which builds teamwork
A vision of academic success and how to improve
Careful use of targets
Use of performance data to guide decisions, targets and tactics
Teamwork both within staff groups and stakeholders
Time and resources for reflection and research
Non-dominating senior managers
Students
Students given responsibility
Shared staff-student activities
Positive student/teacher relationships
Encouraging students to express their view
Concern for students' overall well-being; effective pastoral systems
Pupil rights, responsibilities and building self-esteem
Pupil involvement in learning and other aspects of the school
Positive student attitudes to school
Maximum communication between teachers and students
Good behaviour by students
Community
Positive relationships with the local community
Parental involvement in the life and work of the school
Home-school partnership planning
Links with business, commerce and industry
School governance

There is unprecedented international interest in the question of how educational leader s influence a range of student outcomes. In consequence, at least five reviews of empirical research on the direct and indirect effects of leadership on student outcomes have appeared recently (Bell, Bolam, & Cubillo, 2003; Witziers, Bosker, & Krüger, 2003). A major reason for the interest in the links between leadership and student outcomes is the desire of policy makers in many jurisdictions to reduce the persistent disparities in educational achievement between various social and ethnic groups, and their belief that school leaders play a vital role in doing so. The confidence of the public and politicians in the capacity of school leaders to make a considerable difference to student outcomes is supported by qualitative research on the

impact of leadership on school effectiveness and improvement. Case studies of "turn around" schools and of interventions into teaching and learning invariably credit school and district leadership with considerable responsibility for school and teaching effectiveness (Edmonds, 1979). The literature on sustainability also sees the quality of school leadership as a key to continued organizational learning and improvement (Datnow, 2005; Hargreaves & Fink, 2006). However, the picture one gains from the qualitative evidence for the impact of leadership is very different from that gained from quantitative analyses of the direct and indirect effects of leadership on students' academic and social outcomes. In a meta-analysis of 37 multinational studies of the direct effects of leadership on student outcomes, Witziers reports an average effect (reported as a *z* score) of 0.02, an estimate that is typically interpreted as indicating no or a very weak impact (Witziers et al., 2003). Most subsequent quantitative research has conceptualized the relationship between leadership and student outcomes as indirect, with leaders establishing the conditions (e.g., provision of teacher professional learning opportunities, forms of student grouping) through which teachers make a more direct impact on students. In the only published meta-analysis of such research, Marzano reports an average effect of approximately 0.4 between leadership and student academic outcomes (Marzano et al., 2005).

Effective leadership has a key role in motivating teachers towards individual and shared learning, a factor which is considered to be quite important for school effectiveness to be achieved (Leithwood & Jantzi, 2000). Consequently, it becomes clear that leadership is the mediator which has the authority to develop and empower teachers in the quest of school effectiveness (Huber, 2004). Over the past 25 years there are several different theoretical models concerning the educational leadership. However, two basic models have dominated: the instructional leadership and the transformational leadership (Hallinger, 2003). Each one of these models considers the school principal's role and its characteristics from a different perspective. The idea of the educational instructional leadership which was introduced during the early 1980s describes a principal who wants to manage, supervise and develop curriculum and instruction in the school context (Bamburg & Andrews, 1990). Instructional leaders usually aim to school improvement having a strong goal orientation (Hallinger, 2003) but at the same time they construct an academic pressure because of indicating high expectations from the teachers (Hallinger & Murphy, 1986). According to Hallinger (2000), an instructional leader specifies the school's aims, organizes the instructional program in order to achieve these goals and tries to promote learning by constructing the appropriate climate. Several additional practices are also applied by the principal in the school setting. For example, the communication between the leader and the teaching staff seems to be quite important for the specific educational and learning goals to be extensively known and supported by the total school community. Additionally, the principal should manage the instruction procedure on the whole and supervise the student's progress. An instructional principal tries also to create a positive learning environment by supporting the professional development, sharing his vision and providing strong motivations and inspirations for learning to the teaching staff (Hallinger, 2000). Instructional Leadership has adopted a top-down approach. On the other side, Transformational Leadership seems to have a bottom-up focus. Specifically, it does not come exclusively from the principal; the teaching staff participate too (Leithwood & Jantzi, 2000) and teachers' needs and views are usually taken into consideration For this reason transformational model of leadership is thought to be a kind of shared or distributed leadership which, based on bottom-up participation, aims to striking educational change (Day et al, 2001). Moreover, contrary to the instructional leadership which is established on direct management and supervision of teaching (Leitner, 1994), transformational principals enforce teachers'

capacity and engage them in collaboratively learning. This type of head teachers attempts to link the individual goals with the organizational ones and as a consequence creates the climate where the educators have the chance to be self-motivated towards the achievement of school effectiveness, without the principal's guidance being necessary (Hallinger, 2003).

C. Method

The study used sequential explanatory mixed methods research with quantitative and qualitative approaches. Sequential explanatory mixed method have characteristic an initial phase of qualitatif data collection and analaysis followed by a phase quantitative data collection and analysis. Qualitative research uses phenomenological studies to describe early school leadership and school effectiveness in this case relating to teachers and students, whereas quantitative research uses SEM (Structured equational modeling) based on qualitative research results to be identified.

Design of this study

The design study was adopted from Tashakkori & Teddlie (2003 in Cameron, 2009), with sequential mixed method quantitative and qualitative approach. There are two phase, the fist phase ex post facto, survey and focus grup, and the second phase is formative evaluation design sub type, field study combined process and product evaluation. The data will get from qualitative approach, and to be continue with quantitative analysis and meta inference confirmatory.

Subject and methode for data collection

This study used subject leader of school, teachers and students throughout East Java specially in madrasah school. Data collection with in-dept interwiew, observation, focus grup discussion for qualitative, and quesioner and surveys for quantitative research.

Analysis data

Analysis data for quantitative used structure equation model (SEM), while qualitative data used procedure analysis there are example ; transcrip data, coding and member checking.

Result

the results of this research have been proposed, (1) effective schools are schools that have good programs, are able to carry out planned programs and conduct measurable evaluations. In preparing the school program engages the community actively with the 8 national standards of education and school vision that have been agreed upon (2). In effective school assistance, it has been found that the results of this study are management involving school residents and stakeholders of interest and are actively receiving input and advice from parents and students. (3). Effective school impact can be measured from the productivity of teachers in the work and for students is the whole potential of students can be accommodated and can be developed in sustainability. (4). The principal has an important role because the whole line so that all school structures can run as plans and procedures that have been mutually agreed. The above results are the result of the quantitative as an ingredient in the development of instruments or measuring instruments in quantitative research. This research has not presented a quantitative result using a structural equation model approach.

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Anxiety in Learning English among Thai Undergraduates: Effects on Listening Abilities

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Abstract

Several studies have revealed that anxiety can hinder success in foreign language learning, and it is estimated that one-third of foreign language learners suffer from foreign language anxiety. To minimize learners' foreign language anxiety, it is important for language teachers to identify the types and levels of learners' anxiety in language classes. Consequently, the purposes of this study were to investigate the types and level of anxiety among Thai undergraduates when they learned English in a Thai university context. Furthermore, it aimed to examine the differences between male and female students and their levels of English proficiency whether they were influenced by their anxiety. The relationship between students' listening abilities and the anxiety were also explored. The participants were 40 undergraduates ranging from 24 males and 16 females. Data were collected by two-set questionnaires and open-ended questions. Statistical analyses used were Descriptive Statistics, Independent-Samples T-Test, and Pearson's Product Moment Correlation Coefficient. Results revealed that
Thai learners had medium anxiety ($M = 3.12$). The highest anxiety among the participants was that even if they were well prepared for language class, they still felt anxious ($M = 3.70$), whereas the lowest anxiety was they were worried about getting left behind if language classes moved so quickly ($M = 2.55$). Females had higher level of anxiety than males did. Female students felt frightened when they were given negative evaluation ($p = .008$) Moreover, the learners' levels of English proficiency did not affect their language anxiety. The high proficient students had higher anxiety than the lower proficient students did. Finally, there was no significant relationship between students' listening abilities and their anxiety ($r = .259$, $p < .01$).

Keywords: *anxiety, gender difference, language learning, listening, and Thai undergraduate*

Introduction

There have been many educators in foreign language learning examining the problems and difficulties of foreign language learners (Ganschow, Sparks, Anderson, Javorshy, Skinner & Jon, 1994). They indicate that learners who have difficulty with foreign language learning are often considered as underachievers, less motivated learners (Chen & Chang, 2004; Tercanlioglu, 2004) or learners who have some language learning disabilities (Reed & Stansfield, 2004). Other factors that may influence foreign language learning are affective variables such as attitude, motivation, anxiety and beliefs. Amongst these affective factors, anxiety has been given much attention.

Anxiety, in general, is defined as a psychological construct which is described as a state of apprehension, and a vague fear that is only indirectly associated with an object (Hilgard, Atkinson, & Atkinson, 1971). Anxiety has some effects on several types of learning

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including second or foreign language learning. Horwitz et al. (1986) define foreign language anxiety as a distinct complex of self-perceptions, beliefs, feelings, and behaviors related to classroom learning arising from the uniqueness of the language learning process. Foreign language anxiety can occur when learners are exposed to several negative experiences in a foreign language context (MacIntyre and Gardner, 1991; MacIntyre and Gardner, 1994; Chen and Chang, 2004; Sparks and Ganschow, 2007; Hewitt and Stephenson, 2012). The negative experiences can "make learners get discouraged, lose faith in their abilities, escape from participating in classroom activities, and even give up the effort to learn a language well" (Na, 2007). Learners with high anxiety tend to perform their language abilities at lower levels than those with lower anxiety (Cui, 2011). Moreover, they are likely to have low self-esteem, low sense of competitiveness, communication apprehension, and lack of positive attitudes and beliefs towards language learning (Young, 1994)

Horwitz et al. (1986) classify foreign language anxiety into three categories, that is, communication apprehension, test anxiety, and fear of negative evaluation. First, communication apprehension is characterized by fear and anxiety in communicating with people. Foreign language learners have difficulty not only in speaking but also comprehending messages from others. In other words, learners have difficulty in understanding others or in being understood. This causes learners become shy and keep silent in the language classes. Second, test anxiety is a type of performance anxiety which is caused by fear of failing a test. Test anxious students often put unrealistic demands on themselves. Test anxiety is considered to be one of the most important aspects of negative motivation which affects learning. This type of fear is defined as an unpleasant feeling or emotional state that associates with both learners' physiology and their behaviors while taking formal tests or other evaluative situations. Finally, fear of negative evaluation is the apprehension about other people's evaluations. This includes the avoidance of evaluative situations and the expectations that others might evaluate them negatively. Learners with fear of negative evaluation tend to perceive themselves as inadequate and are often scared of other's opinions or evaluations about themselves. Besides, foreign language anxiety may potentially stem from various sources such as instructional practices, learners' competence, task types, and teachers' behaviors (Horwitz, 2001). Young (1991) proposed six causes of foreign language anxiety including personal and interpersonal anxiety, learners' belief in language learning, instructors' belief in language teaching, the interaction between learners and instructor in classes, classroom management, and testing. Thus, it can be concluded that the sources of foreign language anxiety involve learners' internal factors such as personal anxiety and their belief in language learning and external factors such as the interaction between learners and instructor in classes and classroom management. To minimize learners' foreign language anxiety, Horwitz et al. (1986) suggest that it is important for language teachers to identify the types of learners' anxiety in language classes because it can help the teachers realize and reduce the causes and levels of foreign language anxiety occurring in the learners themselves efficiently. It is also useful for the teachers in managing learning methodologies, learning materials, learning environment, and evaluation process suiting the particular learners.

There have been numerous studies examining the effects of anxiety in language classes and the relationship between foreign language anxiety and learning achievement. For example, Krashen (1985) found that the anxious learners had difficulty in processing meaningful input and they became less responsive to language output. MacIntyre and Gardner (1994) indicated that the anxious learners could not express their own opinions properly, and they were likely to underestimate their own abilities. Sellers (2000) explained

more anxious learners in reading tended to recall less passage content than less anxious learners did, and they experienced more off-task interfering their thoughts while reading than their less anxious counterparts, whereas Djigunovic (2006) reported that the high anxious learners in speaking produced longer texts and smaller amounts of continuous speech. They also had longer mid-clause pauses, made fewer repetitions, and made more false starts than the low anxious learners did. However, there have been some studies revealed that there was no a significant relationship between language anxiety and learning achievement (Wang, 2003; Lei, 2004; and Tang, 2005). From these studies, language anxiety may be influenced by some other factors such as gender, culture, years of study, and learners' language proficiency. Therefore, this study aimed to investigate the types and level of language anxiety among Thai undergraduates when they learned English; and to examine the differences between male and female learners and their levels of English proficiency whether they were influenced by their anxiety. Lastly, the relationship between learners' listening abilities and the language anxiety were also explored because listening is an essential skill which develops faster than speaking and often affects the development of reading and writing abilities in learning a new language (Scarcella and Oxford, 1992; Oxford, 1993). In addition, listening ability is considered as a barrier as language anxiety for language learners. Both of them cause the learners hardly succeed in their target language

Research Questions

The research questions in the present study are following:

1) What types and level of English language anxiety do the undergraduates at Thai-Nichi Institute of Technology (TNI) experience?
2) Do learners 'gender and their levels of English proficiency affect their anxiety in English learning?
3) Is there any relationship between learners' listening abilities and English language anxiety?

Methodology

Participants

The participants were 40 students who completed three English compulsory courses and enrolled in the elective English course: ENL-411 English through Multimedia in the second semester in 2015 academic year. There were 24 males and 16 females from three different faculties at Thai-Nichi Institute of Technology (TNI). They were selected through the purposive sampling method on the basis of convenience and availability.

Instruments

Two instruments were used for this study. First, the Foreign Language Classroom Anxiety Scales (FLCAS), which was developed by Horwitz et al. (1986), was used to identify and measure learners' foreign language anxiety. It consists of 33 items using a 5-point Likert scale ranging from 1-5, namely, *strongly agree = 5, agree = 4, neutral = 3, disagree = 2, strongly disagree = 1.* It has a high reliability (α) at .89. The questionnaire is divided into two parts: The first part is used for gathering the participants' demographic data: sex, year of study, major, faculty, and the average of English grade. The second part is used for investigating the types and level of participants' anxiety in learning English in formal classes. All 33 items are categorized into 4 categories – communication anxiety, test anxiety, fear of negative evaluation, and English classroom anxiety. Second, listening strategies questionnaire, which is widely used for learners in Asian contexts, was used to identify the

types and level of learners' abilities in listening. It has a high reliability (α) at .89. The questionnaire consists of 30 items using a 5-point Likert scale ranging from ranging from 1 to 5, that is, *never use = 1, rarely use = 2, sometimes use = 3, frequently use = 4, and always use = 5.* All 30 items were categorized into 5 categories – metacognitive strategies, cognitive strategies, compensation strategies, memory strategies, and affective strategies.

Data Analysis

To analyze the data, the Statistical Package for the Social Science (SPSS) for Microsoft Windows 11.5 was used. Descriptive statistics including frequencies, means (*M*), standard deviations (*SD*) were implemented to examine the participants' demographic data, the types and level of participants' anxiety in learning English, and the types and level of participants' listening abilities. Next, Independent-Samples T-test was used to determine whether there is a significant relationship existed between participants' gender and the types and level of foreign language anxiety. To examine the relationship between English language anxiety and the participants' levels of English proficiency, the participants' English grades were divided into two groups: the high proficient learners (22 students) whose grades were A, B+, B; and the low proficient learners (18 students) whose grades were C+, C, D+, D. Then Independent-Samples T-test was used to explore the relationship. Finally, Pearson Product-Moment Coefficient was used to investigate the relationship between participants' English language anxiety and their listening abilities whether they were correlated.

Results

1) **What types and level of English language anxiety do the undergraduates at Thai-Nichi Institute of Technology experience?**

Descriptive statistics was employed to investigate the level of English language anxiety of the undergraduates who enrolled in the elective English course: ENL-411 English through Multimedia at Thai-Nichi Institute of Technology (TNI), Thailand. Table 1 illustrates the mean of the inclusive English language anxiety categorized into four categories. The highest level of anxiety that the participants experienced while they were studying English was fear of negative evaluation (*M = 3.19*), followed by communication anxiety (*M = 3.17*), English classroom anxiety (*M = 3.09*), and finally test anxiety (*M = 3.03*). As a result, the level of English language anxiety that the participants encountered was medium (*M = 3.12*)

Table 1: Descriptive Statistic Results on the Level of English Language Anxiety of 40 Undergraduates at TNI (N = 40)

Rank Order	Four Categories of Language Anxiety	*M*	*SD*	Level of English Language Anxiety
1	Fear of Negative Evaluation	3.19	.87	Medium
2	Communication Anxiety	3.17	.62	Medium
3	English Classroom Anxiety	3.09	.58	Medium
4	Test Anxiety	3.03	.64	Medium
	Total of English Anxiety on Average	**3.12**	**.57**	**Medium**

2) Do learners 'gender and their levels of English proficiency affect their anxiety in English learning?

Descriptive Statistics was used to examine the level of English language anxiety regarding the gender difference and the levels of English proficiency of the participants. As shown in Table 2, the mean of the inclusive English language anxiety between male and female students revealed that females had higher English language anxiety than males (Females: *M = 3.27*; Males: *M = 3.02*), which was considered as medium level of English language anxiety. Female students had high level of English language anxiety in fear of negative evaluation (*M = 3.63*) while male students had medium level (*M = 2.90*). Then Independent-Sample T-test was used to analyze the relationship between participants' gender and their level of English language anxiety. The results of the t-test analysis indicated that there were no significant differences between gender and four categories of language anxiety; for example, communication anxiety, fear of negative evaluation, test anxiety, and English classroom anxiety at .05 significant level. However, there was a significant difference between gender and fear of negative evaluation at .05 significant level (p = .008), which female students had higher fear of negative evaluation than males did (Females: *M = 3.63*; Males: *M = 2.90*).

Table 2: Descriptive Statistic and the Relationship between the Level of English Language Anxiety and Students' Gender Results (N = 40)

Types of Language Anxiety	Gender	*M*	*SD*	*t*	*p*
Communication Anxiety	Male	3.16	.40	-.180	.839
	Female	3.20	.86		
Fear of Negative Evaluation	Male	2.90	.74	-2.804	.008*
	Female	3.63	.88		
Test Anxiety	Male	3.00	.61	-.355	.725
	Female	3.07	.70		
English Classroom Anxiety	Male	3.04	.52	-.677	.502
	Female	3.17	.67		
Total of English Anxiety on Average	Male	**3.02**	**.45**	**-1.220**	**.192**
	Female	**3.27**	**.70**		

p < .05

In addition, the mean of the inclusive English language anxiety between the high English proficient learners and the low English proficient learners were presented in Table 3. The high English proficient learners had higher language anxiety than the low proficient ones (High Learners, *M = 3.14*; Low Learners, *M 3.09*), which their level of English language anxiety was medium level. Nevertheless, the low proficient English learners had higher English classroom anxiety than the high proficient learners (High Learners, *M = 3.08*; Low Learners, *M 3.10*). Then Independent-Sample T-test was used to analyze the relationship between participants' level of English language anxiety and their English proficiency. The results of the t-test analysis indicated that there were no significant differences between participants' level of English language anxiety and their English proficiency at .05 significant level (*p = .774).*

Table 3: Descriptive Statistic and the Relationship between the Level of English Language Anxiety and the Levels of Students' English Proficiency Results (N = 40)

Types of Language Anxiety	Level of English Proficiency	*M*	*SD*	*t*	*p*
Communication Anxiety	High Learners	3.22	.55	.980	.587
	Low Learners	3.11	.70		
Fear of Negative Evaluation	High Learners	3.23	.79	.290	.766
	Low Learners	3.14	.97		
Test Anxiety	High Learners	3.04	.70	.523	.870
	Low Learners	3.01	.58		
English Classroom Anxiety	High Learners	3.08	.56	.410	.940
	Low Learners	3.10	.62		
Total of English Anxiety on Average	**High Learners**	**3.14**	**.55**	**.765**	**.774**
	Low Learners	**3.09**	**.60**		

p < .05

3) Is there any relationship between learners' listening abilities and English language anxiety?

To examine the relationship between learners' listening abilities and English language anxiety, Pearson product-moment correlation coefficient (r) was used in this study because it was considered as the most common correlation technique (McMillan & Schumacher, 1997). The results indicated that there was no significant relationship between learners' listening abilities and English language anxiety. Their relationship were low at $r = .259, p < .01$. However, there was a significant relationship between learners' listening abilities and their level of English proficiency ($r = -.424^{**}, p < .01$) as shown in Table 4.

Table 4: Summary of Intercorrelations between Learners' Listening Abilities, English Language Anxiety, and Learners' Level of English Proficiency (N = 40)

	English Language Anxiety	Learners' Level of English Proficiency
Listening Strategies	.259	.-424**
		.006

**. Correlation is significant at the 0.01 level ($p < .01$)

Discussion

1) **What types and level of English language anxiety do the undergraduates at Thai-Nichi Institute of Technology experience?**

The results from the data analysis revealed that the level of English language anxiety of the undergraduates who enrolled in the elective English course: ENL-411 English through Multimedia at Thai-Nichi Institute of Technology (TNI) was medium level (*M* = 3.12). Horwitz (2008) indicated that "students with averages around 3 should be considered slightly anxious, while students with averages below 3 are probably not very anxious. Students who get average 4 and above, are probably fairly anxious". Thus, Thai students in this study had some anxiety when they were learning English. The findings pointed out that the highest level of anxiety that they experienced was fear of negative evaluation (*M = 3.19*), which is consistent with Ohata's study (2005). Ohata stated that the learners felt uneasy when teachers and friends corrected their mistakes. Moreover, fear of losing face in front of others was found to be a common anxious feeling perceived by language learners. The students usually express their anxiety in evaluative situations in which their knowledge and performance of English are monitored by people around them. Furthermore, although many learners feel that some error correction is necessary (Koch & Terrell, 1991; Horwitz, 1988), the manner of error correction is often cited as a provoking anxiety. It is found that students are more concerned about how many and when their mistakes are corrected rather than whether error correction should be administered in class.

2) **Do learners 'gender and their levels of English proficiency affect their anxiety in English learning?**

The results indicated that female students had more anxiety in learning English than male students did (Females: *M = 3.27*; Males: *M = 3.02*). The findings are different from previous studies in that male learners experienced higher foreign language anxiety than female learners (Campbell, 1999; Kitano, 2001; Cui, 2011; Wang, 2014). The highest anxiety item that females in this study experienced was "I don't understand why some people get so upset over foreign language classes." (*M* = 3.93). This caused by self-perception or self-belief in language learning. Females also reported that "I keep thinking that the other students are better at languages than I am." (*M* = 3.75), and "In language class, I can get so nervous when I forget things I know." (*M* = 3.75) Oxford (1993) explains that females tend to be more

active strategy users, more successful language learners, more adaptive learners, and have more positive attitudes towards studying foreign languages than their male counterparts (Oxford, Nyikos and Ehrman, 1988). Moreover, the results indicated that there were no significant differences between learners' level of English language anxiety and their English proficiency. This is consistent with numerous studies in Chinese contexts (Wang, 2003; Lei 2004; Tang, 2005) which showed that there was no relationship between foreign language anxiety and learner's achievement. However, the result showed that there was a significant difference between gender and fear of negative evaluation which female students had higher fear of negative evaluation than males did. Maubach and Morgan (2001) explained that male students tended to have more self-confidence and risky-taking ability when engaging in communicating a foreign language than females did.

3) **Is there any relationship between learners' listening abilities and English language anxiety?**

Although, the results indicated that there was no significant relationship between learners' listening abilities and English language anxiety, listening abilities had some effects on learners' proficiency in English. Ellis (1994) mentions that the strategies that learners selected to use in each situation can reflect their general stage of second language learning. The successful language learners are the strategic person who can use strategies more greatly and appropriately to the learning tasks. For this reason, Thai learners in this study are strategic listeners who are aware of using listening strategies and can use listening strategies suiting each situation effectively (M = 3.72). Furthermore, the listening strategies that the learners employed the most were compensation strategies (M = 3.97). These strategies can help language learners/listeners overcome their knowledge limitations when they do not hear something clearly or they cannot catch all the words. They can make use of some clues to help them guess the meaning of certain words or pieces of information properly (Oxford, 1990). Based on the open-ended question result, Thai learners responded to the question "*When do you feel most anxious when studying this subject?*" Most of them agreed that they felt most anxious when listening to the authentic materials such as news reports, interviews, and selected movie scenes. They expressed that they could not understand the main ideas of the listening materials if the people spoke with fast speed and had different English accents and pronunciation. Hashemi and Abbasi (2013) also purposed that language learning anxiety may be occurred if the learners lack of sufficient linguistic knowledge in the target language. Therefore, it can be concluded that Thai learners are strategic listeners who employ the strategies to help them understand meaningful sounds, sentences, and situations even though they are not proficient language learners.

Recommendations for Further Research

Anxiety is an important factor that prevents foreign language learners from successful performance in the target language. It is imperative for language teachers to examine the causes of foreign language anxiety and reduce the undesired effects in foreign language teaching to create a low anxiety classroom for the learners (Young, 1991). Thus, further research should be conducted on efficient classroom environment, learning methodologies, learning activities, and evaluation procedure which reduce anxiety in language classes especially in adults EFL learners.

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Applying Speaking Strategies to Overcome Communication Difficulties in Thai EFL Learners

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Abstract

Previous studies indicate that using different strategies lead to different learning performance; and the types of strategies used by language learners depend on the kinds of learners and settings in which the learning occurred. Besides, many educators and researchers have agreed that communication strategies (CSs) are an important factor to determine the success or failure in foreign language learning. These strategies are effective tools to enable foreign language learners to overcome their communication hardships. Thus, this study aims to investigate the different types and levels of English speaking strategies or communication strategies used by Thai EFL learners at Thai technical university; and to examine whether their fields of study affected their strategy use. The participants were 107 students whose ages ranged from 18-22 years old. There were 54 female and 53 male students from three different faculties at Thai-Nichi Institute of Technology (TNI), Thailand. The 35-item communication strategy questionnaire and open-ended questions were employed to collect the data. Then descriptive statistics, independent-samples T-Test, an analysis of variance (ANOVA), and content analysis were used to analyze the data. The findings revealed that the use of English communication strategies of 107 undergraduate students at TNI was moderate (M = 3.49). Male students used higher communication strategies than females did (Males: M = 3.51, Females: M = 3.47). Communication strategies which most Thai students preferred using while having the difficulties in English communication were strategies to understand the interlocutor's message (UIM); for example, trying to catch the interlocutor's main point (M = 4.61), asking the interlocutor for a repetition (M = 4.61), and guessing the meaning of what the interlocutor has said (M = 4.57). Furthermore, there was no significant difference between fields of study or participants' faculties and their use of communication strategies.

Keywords: *communication strategies, EFL learners, speaking strategies, Thai undergraduate students*

Introduction

One of the language skills which language learners must be mastered is the ability to speak or communicate in the target language. Speaking skill is considered as an important skill that can be measured the success of the language learners. Harmer (2001) states that the ability to speak fluently is not only about the knowledge of language features, but also about the ability to process information and language while people are speaking. Consequently, the ability to speak a foreign language is a complex task for language learners to achieve. Brown (2001) indicates that there are some features that make speaking become as a difficult skill for language learners to develop such as reduced forms, colloquial language, stress and intonation, and cultural and social rules of communication setting. Moreover, Alderson and Bachman (2004) explain that in order to speak a foreign language, learners must master the

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sound system of the language, have almost instant access to appropriate vocabulary, be able to put words together intelligibly with minimal hesitation, understand what is being said to them, and be able to respond appropriately to maintain amicable relations or to achieve their communicative goals. Most importantly, language learners must have linguistic competence or the ability to use language correctly. Therefore, it is important for language learners to possess an effective tool which enables them to communicate their target language efficiently and appropriately, that is, communication strategies.

Communication is simply defined as a process in which a message is sent from senders to receivers. According to Lynch (1996, p. 3), "communication involves enabling someone else to understand what we want to tell them, what is often referred to as our message." That means, in a communication situation, three factors are involved: 1) a speaker or a message sender, 2) a message, and 3) a listener or a message receiver. The main purpose of communication is to transmit an intended message to the listener successfully. Thus, it is the responsibility of a message sender to make the message clear and comprehensible for the receiver so that both the message sender and the receiver can reach the communicative goal.

There have been many educators and researchers defining communication strategies of second/foreign language learners. For example, Tarone (1980, p.420; 1983, p.65) defines communication strategies as "a mutual attempt of two interlocutors to agree on a meaning in situations where requisite meaning structures do not seem to be shared." Later, Faerch and Kasper (1983) explain that communication strategies are potentially conscious plans for solving communication's problems, and they can make an individual reach his/her particular communicative goal. Finally, Canale (1983) states that communication strategies consist of both verbal and non-verbal strategies which language learners use to compensate their communication difficulties in order to enhance their understanding through the conversations. Language learners use these strategies due to their limited knowledge in the target language. However, Bialystok (1990) points out that although research scholars offer various definitions for communication strategies, these definitions seem to share three main features: 1) Problematicity includes strategies that are not normally used during routine language operations. These strategies are adopted when problems in either learning or production are perceived – problems that may interrupt communication. 2) Consciousness refers to either the learner's awareness that a strategy is being employed for a particular purpose, or the awareness of how that strategy may lead to an intended effect. 3) Intentionality refers to the learner's control over those strategies so that particular ones may be selected from a range of options and deliberately applied to achieve certain effects. To conclude, communication strategies are helpful methods for an individual to use consciously when he/she encounters communication problems. With these strategies, he/she can overcome their difficulties in communication and make meaningful and purposeful conversations.

Furthermore, Canale and Swain (1980) developed a widely cited framework of communicative competence which consisted of three elements: grammatical competence, sociolinguistic competence, and strategic competence. Later, Canale revised the 1983's framework by allowing for the inclusion of four main areas of competence: grammatical competence, sociolinguistic competence, strategic competence and discourse competence. Compared with the first three components, strategic competence seems to be the most relevant to communication strategies since it consists of interlocutor's ability to utilize communication strategies to compensate for lack of knowledge in other competencies. Typical examples of strategic competence include the use of paraphrase, avoidance of

difficulties, and requests for repetition, simplification, clarification or slower speech. In addition, several educators and researchers (Faerch & Kasper, 1983; Dornyei, 1995; Dornyei and Scott, 1997; and Nakatani, 2006) have purposed the similar classifications of communication strategies. The strategies comprise of two main strategies – reduction or avoidance strategies and achievement strategies or compensatory strategies. Reduction or avoidance strategies are identified as topic avoidance (or message reduction), message abandonment, and message replacement. Language learners rely on them for reducing the content of the intended message from the interlocutor and helping them keep speaking or communicating to the interlocutor. Achievement or compensatory strategies include word coinage, language switch, paraphrase or circumlocution, paralinguistic devices, or appeal for help. Language learners employ these strategies in an attempt to deal with the communication problems directly by using alternatives in order to get the message across.

In Thailand where English is considered as an important foreign language, Thai learners have experienced some problems and difficulties in communicating in English. According to Weerarak (2003), the speaking problems of Thai learners can be classified into two main types: the lack of grammatical knowledge and vocabulary limitations, and the lack of self-confidence in using English. The participants revealed that they sometimes lacked sufficient linguistic and strategic knowledge to maintain the conversation. When they did not know the vocabulary or structure to use, they left the message unfinished and avoid talking about the topic. In addition, they were too shy to speak English and they lacked confidence in speaking English even though they had studied English for more than ten years. Therefore, this study aims to investigate the different types and levels of English speaking strategies or communication strategies used by Thai EFL learners at Thai-Nichi Institute of Technology; and to examine whether their fields of study affected their strategy use. Since communication strategies can be taught explicitly in language classes, it is imperative for language teachers to realize the importance and to identify the types and level of communication strategies that the learners use or lack while speaking. Moreover, previous studies indicated factors affecting the use of communication strategies such as task type and language proficiency (Weerarak, 2003; Nakatani, 2005; Rost and Ross, 1991), but there are few studies examining the fields of study.

Research Questions

The research questions in the present study are following:

1) What types and level of communication strategies do the undergraduates at Thai-Nichi Institute of Technology use while they are having English communication problems?
2) Does learners 'gender affect their use of communication strategies?
3) Do learners' fields of study affect their use of communication strategies?

Methodology

Participants

The participants were 107 students whose ages ranging from 18-22 years old. All of them were the second year students. There were 53 males and 54 females from three different faculties – Faculty of Engineering (45), Faculty of Information Technology (27), and Faculty of Business Administration (35) in the academic year 2015 at Thai-Nichi Institute of Technology (TNI).

Instruments

The instrument used in this study was the communication strategy questionnaire (CSQ) which was developed by Zhao and Intaraprasert (2013). They employed the typologies of communication strategies proposed by Dörnyei and Scott (1997), Mariani (2010), Nakatani, (2006), and Somsai and Inatarprasert (2011). This questionnaire is considered as the most recently established communication strategy questionnaire which has high reliability (α) at .84 The questionnaire was made up of 35 items, including 20 items of strategies for coping with communication problems (CCP) such as using synonym or antonym, using familiar words, phrases or sentences, correcting one's own pronunciation, grammar and lexical mistakes, speaking the first language instead when one doesn't know how to say in English, and using simple expressions; 10 items of strategies for understanding interlocutor's messages (UIM) such as asking the interlocutor to slow down, asking the interlocutor for a repetition, asking the interlocutor to simplify the language, asking the interlocutor to write out the key word, and asking the interlocutor to give an example; and 5 items of strategies for carrying on the conversation as intended (CCI) such as trying to enjoy the conversation, sending continuation signals to show one's understanding, and feeling all right for taking risks while speaking. The participants were asked a choice of five Likert-scale responses to each communication strategy ranging from 1 to 5, that is, 1 = never use, 2 = rarely use, 3 = sometimes use, 4 = frequently use, and 5 = always use. The criteria for assessing the types and level of communication strategy use are: lowest frequency use (1.0 – 1.49), low frequency use (1.5 – 2.49), moderate frequency use (2.5 – 3.49), high frequency use (3.5 – 4.49), and highest frequency use (4.5 – 5.0).

Data Analysis

To analyze the data, the Statistical Package for the Social Science (SPSS) for Microsoft Windows 11.5 was used. Descriptive statistics including frequencies, means (*M*), standard deviations (*SD*) were implemented to examine the participants' demographic data, the types and level of participants' communication strategies. Next, Independent-Samples T-test was used to determine whether there is a significant relationship existed between participants' gender and the types and level communication strategies. Finally, an analysis of variance (ANOVA) or F-test was used to examine the relationship between field of study or the faculties that the participants are studying and their use of communication strategies.

Results

1) **What types and level of communication strategies do the undergraduates at Thai-Nichi Institute of Technology use while they are having English communication problems?**

Descriptive statistics was employed to investigate the frequency use of communication strategies of the second year students in the three faculties at Thai-Nichi Institute of Technology (TNI), Thailand. Table 1 illustrates the mean of frequency of overall communication strategy use was 3.49, which was considered as a moderate level ranged from 1 to 5. The most frequently used strategies was strategies for understanding interlocutor's messages (UIM; *M* = 3.76), followed by strategies for coping with communication problems (CCP; *M* = 3.41), and finally strategies for carrying on the conversation as intended (CCI; *M* = 3.30).

Table 1: Descriptive Statistic Results on the Frequency of Communication Strategy Use among the Second-Year Students at TNI (N = 107)

Rank Order	3 Types of Communication Strategies	*M*	*SD*	Frequency of Use	Level of Use
1	UIM	3.76	.27	usually	high
2	CCP	3.41	.19	sometimes	moderate
3	CCI	3.30	.40	sometimes	moderate
	Overall Communication Strategy Use on Average	**3.49**	**.18**	**sometimes**	**moderate**

2) Does learners 'gender affect their use of communication strategies?

Descriptive Statistics was used to examine the use of communication strategies regarding the gender difference among the second year students. As shown in Table 2, the mean of frequency of male learners in overall communication strategy use was 3.51, which was considered as high strategy users, whereas the mean of frequency of female learners was 3.47, which was considered as moderate strategy users. However, in each type of communication strategies, it was revealed that females used higher strategies for understanding interlocutor's messages (Females: $M = 3.77$, Males: $M = 3.74$) and strategies for coping with communication problems than males did (Females: $M = 3.43$, Males: $M = 3.40$). Strategies for carrying on the conversation as intended were found to be the least strategies that both males and females used. Males used these strategies higher than females did (Males: $M = 3.38$, Female: $M = 3.22$). Then Independent-Sample T-test was used to analyze the relationship between participants' gender and their communication strategy usage. The results of the t-test analysis indicated that there were no significant difference between gender and overall communication strategy types at .05 significant level ($p = .312$) However, there was a significant difference between gender and strategies for carrying on the conversation as intended at .05 significant level ($p = .031$) which female students used these strategies while speaking English lower than males did.

Table 2: Descriptive Statistic and the Relationship between Communication Strategies and Students' Gender Results (N = 107)

Types of Communication Strategies	Gender	*M*	*SD*	*t*	*p*
CCP	Male	3.40	.16	-.843	.401
	Female	3.43	.22		
UIM	Male	3.74	.23	-.544	.588
	Female	3.77	.30		
CCI	Male	3.38	.38	2.183	.031**
	Female	3.22	.39		
Total of Communication Strategies on Average	Male	**3.51**	**.17**	**1.016**	**.312**
	Female	**3.47**	**.18**		

p < .05

3) Do learners' fields of study affect their use of communication strategies?

To examine the relationship between learners' communication strategies and their fields of study, an analysis of variance (ANOVA) or F-test was used in this study because there are three faculties, that is, Faculty of Engineering, Faculty of Information Technology, and Faculty of Business Administration. As shown in Table 3, Faculty of Information Technology used the highest level of communication strategies (M = 3.51), followed by Faculty of Business Administration (M = 3.50), and lastly, Faculty of Engineering (M = 3.47). Furthermore, the results indicated that there was no significant relationship between learners' communication strategies and their fields of study (p = .653) as shown in Table 4.

Table 3: Descriptive Statistic Results on the Frequency of Communication Strategy Use among Three Faculties at TNI (N = 107)

Rank Order	Fields of Study (Faculty)	*M*	*SD*	Frequency of Use	Level of Use
1	Information Technology	3.51	.15	usually	high
2	Business Administration	3.50	.18	usually	high
3	Engineering	3.47	.18	sometimes	moderate
	Overall Communication Strategy Use on Average	**3.49**	**.18**	**sometimes**	**moderate**

Table 4: Comparing the Fields of Study and the Use of Communication Strategies of the Second-Year Students (N = 107)

Communication Strategies

Fields of Study	***SS***	***df***	***MS***	***F***	***P***
Between Groups	.028	2	.014	.428	**.653**
Within Groups	3.422	104	.033		
Total	3.450	106			

p < .05

Discussion

1) What types and level of communication strategies do the undergraduates at Thai-Nichi Institute of Technology use while they are having English communication problems?

The results from the data analysis revealed that the second year undergraduate students at Thai-Nichi Institute of Technology (TNI), Thailand were moderate communication strategy users (M = 3.49) Ellis (1994) mentions that the strategies that learners selected to use in each situation can reflect their general stage of second language learning. The successful language learners are the strategic person who can use strategies more greatly and appropriately to the learning tasks. For this reason, it cannot be concluded that the participants in the study were strategic users and proficient in English yet. However, Lightbrown and Spada (1999) state that in Long's theory, second language acquisition takes place through conversational interaction, and in Vygotsky's theory, all cognitive development including language development arises as a result of social interactions between individuals. The most frequently used strategies in communication strategies was strategies for understanding interlocutor's messages (UIM; M = 3.76); for example, trying to catch the interlocutor's main point (M = 4.61), asking the interlocutor for a repetition (M = 4.61), and guessing the meaning of what the interlocutor has said (M = 4.57). These strategies are classified as social strategies which involve the interaction with others. Lightbrown and Spada (1999) explain that when second/foreign language learners face communicative problems and they have the opportunity to negotiate solutions to the interlocutors such as making the comprehension checks by the native speakers or more fluent speakers, making clarification requests by the learners themselves, and making self-repetition or paraphrase by the native speakers or more fluent speakers; the learners are able to acquire new language or develop their target language effectively. Therefore, it can be stated that although the learners have not been English proficient and still have communication problems, they have much effort to make themselves comprehend what the interlocutors are speaking and have a positive motivation to master their speaking abilities.

2) Does learners 'gender affect their use of communication strategies?

The result indicated that male learners used the overall communication strategies more frequently than female learners (Male: M = 3.51; Female: M = 3.47). This finding is different

from Mori and Gobel's 2006 study which Zhao and Intaraprasert (2013) cited in their study that female learners used communication strategies more frequently than male learners did. Females are more active in language classes than males are. However, the findings in this study revealed that females used higher strategies for understanding interlocutor's messages and strategies for coping with communication problems than males did. Zhao and Intaraprasert (2013) explained that female learners were more interested in interaction and intended to make themselves understand the conversations. Moreover, females had more desire to practice English with their friends, and they had greater interest in making a direct contact with English speaking people than their male counterparts. Nevertheless, the findings found that males used strategies for carrying on the conversation higher than females did. Males tend to be more self-confident in communicating in English than females. According to Maubach and Morgan (2001, p. 44), they explained that "males seem much more self-reliant in keeping a conversation going, tending to follow their own instincts, sometimes even under-preparing material due to an over-confidence in their oral abilities".

3) Do learners' fields of study affect their use of communication strategies?

The results indicated that fields of study did not show the significant differences in the use of students' communication strategies. Faculty of Information Technology used the highest level of communication strategies, followed by Faculty of Business Administration, and lastly Faculty of Engineering. The students in both Faculty of Information Technology, and Faculty of Business Administration were considered as high strategy users. Based on this finding, it cannot be concluded that these students can speak fluently. They use many types of strategies because they are facing some difficulties in speaking English. Canale (1983) states that language learners use verbal and non-verbal strategies to compensate their limited knowledge in communicating the target language. In addition, since these faculties had the similar frequency use of communication strategy, the possible explanation is that the students may have similar learning achievement or English proficiency. Therefore, fields of study slightly relate to the use of students' communication strategies. In other words, they do not influence much on strategy usage of the students.

Pedagogical Implications

It is recommended that it is useful to incorporate communication strategies into language classrooms. Language teachers should teach these strategies explicitly because they can enable the students to overcome their communication difficulties and strengthen their speaking skills and confidence in English efficiently. Moreover, language teachers should employ the negotiation techniques in their teaching methods. These can raise students' awareness in learning a second/foreign language and improve students' language acquisition.

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Teaching Mathematics through Active Learning Approach

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ABSTRACT

Engaging learners in Mathematics classroom is challenging to educators. In this lesson, the researchers designed activities for students to be involved in learning the concept of fractions. The lesson made use of a problem to learn the operations on fractions and its applications. The students presented solutions in solving the problem but presented varied ways of proving their answers.

Group and independent learning activities were also done in the lesson to check their understanding on learning the content. In these activities, students gave justifications on their answers to the problem posted. Results showed that learners found it challenging to explain the process of solving a problem as well as giving justification on their answers. To give opportunity for students connect mathematics to real- world activities, learners were asked to formulate their own real - world problem related to fractions. Result showed that students were more engage in writing their own real – world problem if they are allowed to express it in their own language.

The researchers conclude that active learning in Mathematics classroom involved students in the learning process to do meaningful tasks and think about on how to solve a problem. With this result, the researchers recommend that teachers need to design Mathematics activities that promote active learning to develop learners' problem-solving, communication and critical thinking skills in Mathematics classroom.

Keywords: *Active Learning in Mathematics, Problem Solving, Learner- centered*

1. Introduction

For students to learn Mathematics, they have to actually do mathematics for themselves rather than learn to follow how someone else does it; and that this "doing" or constructing of mathematics for oneself is called constructivist approach to teaching. Constructivist teaching and learning theories suggest that active participation has crucial importance in students' learning process. The term active learning refers to the learners' active role in constructing meaning and thinking about their learning. Ownership and responsibilities for their learning progress are the important characteristic of a learner in active learning classroom (Slavin 1997 as cited Kim, 2009). Pahin (2007) asserted that the purpose active learning methods are to enhance the conceptual learning of students, to provide students with different perspectives

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towards inquiry and research and help them gain creativity, and ensure the stability of knowledge. The study of Lake (2001) investigated on the performance of the active learning classroom versus the lecture method, result showed that course grades were higher in active learning classroom than the lecture classroom.

The implementation of learner – centered K-12 curriculum in Mathematics has challenged teachers to create supportive active learning environments for learners to do worthwhile mathematical tasks and to manage students' behaviors in problem solving task.

2. Purpose of the Study

The purpose of this study is to implement the active learning approach in Mathematics classroom. This study examined on students' outputs on a problem-solving task. Specifically, this research seeks to answer the following problem a) What are the varied answers of the students in solving the problem? b) What are the student – teacher interaction and c) What are the problems created in active learning Mathematics classroom.

3. Sample of the Study

The sample of the study were the 28 grade 6 students of one of the schools in the province of Bukidnon, Region 10 Philippines. The teachers in this school has been participating the "Teaching through Problem Solving" workshop by the Department of Science and Technology – Science Education Institute conducted by MSU – Iligan Institute of Technology College of Education

4. Research Methodology

4.1 Theoretical Framework

Teaching through problem solving was employed in teaching the lesson of fractions for grade six students. The teaching through problem solving approach involves four phases namely a) presentation of the problem b) developing a solution c) processing through discussion and d) generalization. In this approach a challenging problem was posted where no prescribed rules to follow. The chosen tasks are critical to students learning. Van de Walle (2007) asserted that challenging task is describe as one for which the student has nor prescribed rules or methods to follow and that there no perception by the students that there is a unique correct answer.

4.2 Data Collection and Analysis

Phenomenological research was employed in this study were variety of solutions, teacher- student interactions and problems created were analyzed during an implementation of the lessons.

5. Results and Discussion

In this research, active learning approach was implemented in teaching fraction where the teacher process described in the Figure 1.

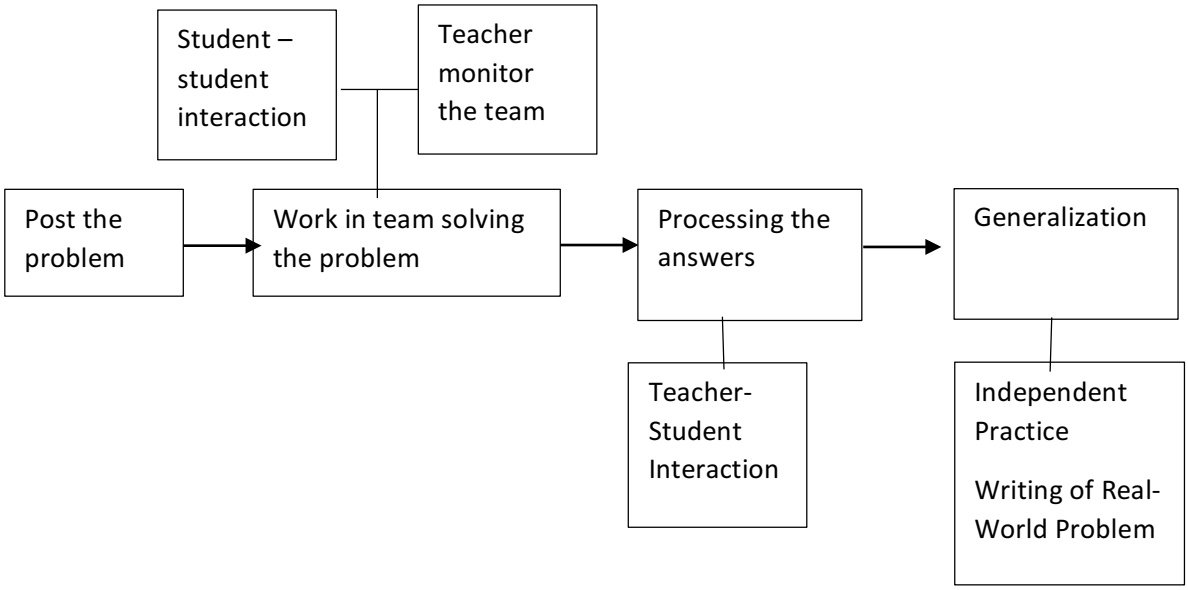

Figure 1. Implementation of active learning approach for grade six students

A. The Varied answers of the students

Problem: Problem 1 : Jonas and Gina have $1\frac{1}{2}$ meters of rope and want to cut them equally for knot tying competition in their BSP Camp-O-Ral and GSP Encampment. In what ways can this rope be cut?

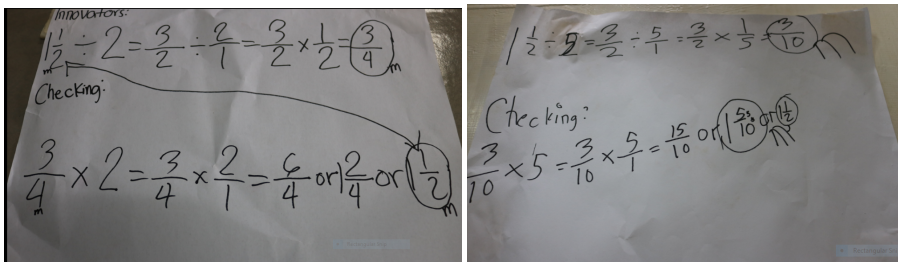

Figure 2. Sample group output

Most of the groups have presented at least two solutions of the problem presented. Figure 2 presented sample output of the students. They shared their answers and explained to the class on how they arrived with the answers.

Teacher - Group Innovators, How did you get that answers?
Student 1: we change mixed fraction and whole number to fraction and multiply the reciprocal.
Teacher: So what operation did you used?
Student 1: We used division
Teacher: Ok, so you used Division, to divide that rope. How did you know innovators that it is Division?
Student2: Because of the word ***"EQUALLY"***
Teacher: What strategy did you used?
Student 3: We analyze.

Teacher: Very good so you analyzed. How did you analyzed or What specific activity you do with your group in analyzing this problem?
Student 4: We find out what is asked, what are given what operation to used etc. (mentioned all the procedures in solving a problem. –
Teacher: How did you know that your answer is correct?
Student 4: we do the checking (Multiplying Quotient and Divisor), And the product equals our dividend.
Teacher: Can you prove that?
Student 4: The group did not cut the rope but used a ribbon instead same length as the rope.

Student 4 Justification : With a full stretch of a 1 and ½ ribbon holding it end to end.
The student cut the ribbon into 2 and measure each rope cut
Mao ni ang 1 and ½ meter nga rope among gitunga ug kaduha.
With 2 cut ribbons full stretch presented by to other members of the group.
Mao ni and 2 nag ang katag ason nila kada usa kay ¾ meter each.

The process showed with the active learning approach give opportunities for students to present their varied solutions and made justifications on their answers. The students also realized that if they divide the rope in five parts, the rope lengths would be smaller compared to rope cut into two parts. With this, they understand on how to divide fractions and realized the importance of the skill.234`1

An independent learning activity was done, where students created a problem and solve it. One problem with a solution is presented in Figure 3. Sample student output showed that she made representations/ drawing for her to justify on her answer.

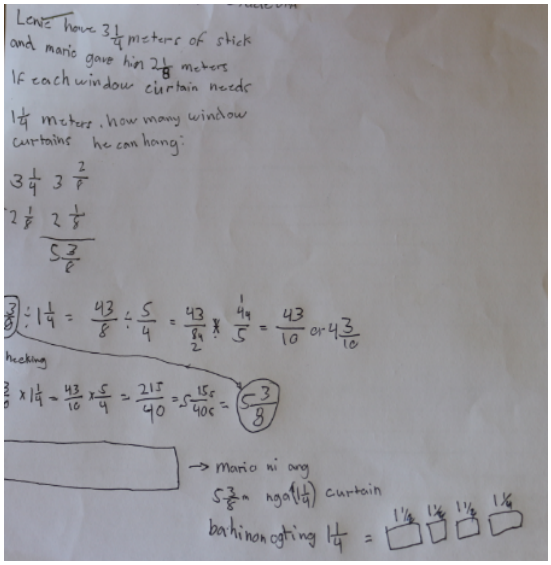

Figure 3. Sample problem and solution of the student on using fractions on real- world

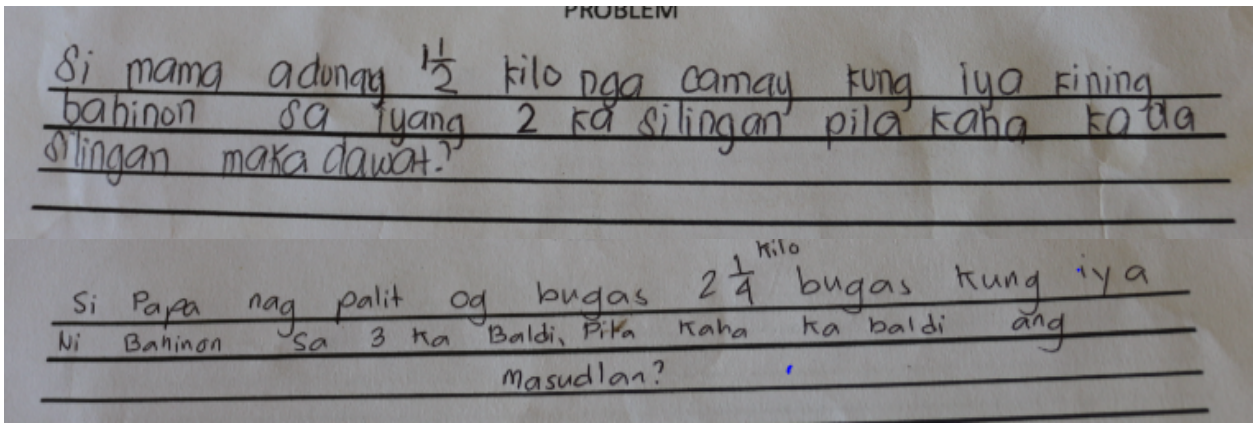

Figure 4. Sample problem written in vernacular language

In addition, there are students wrote their problem in vernacular language. This result showed that students able to realize the applications of Mathematics lesson in real world application.

6. Conclusion and Recommendations

In this lesson, the researchers designed activities for students to be involved in learning the concept of fractions. The lesson made use of a problem to learn the operations on fractions and its applications. The students presented varied solutions in solving the problem and justify their answers. Results showed that learners found it challenging to explain the process of solving a problem as well as giving justification on their answers. To give opportunity for students connect mathematics to real- world activities, learners were asked to formulate their own real - world problem related to fractions. Result showed that students were more engage in writing their own real – world problem if they are allowed to express it in their own language.

The researchers conclude that active learning in Mathematics classroom involved students in the learning process to do meaningful tasks and think about on how to solve a problem. With this result, the researchers recommend that teachers need to design Mathematics activities that promote active learning to develop learners' problem-solving, communication and critical thinking skills in Mathematics classroom.

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The Influence of Demonstration Learning Method toward Fine Motor Ability of Autism Children in Kindergarten Mentari School Sidoarjo

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Abstract

Fine motor ability required to be developed for autism children because it was needed in doing daily activity. The aspects of fine motor ability developed in this research were holding, taking a pinch, and inserting things. The learning method used to enhance the fine motor ability was demonstration learning method which demonstrated the steps of learning activities from the start till the end. Subject in this reaserch is that autism children aged five to six years, amounting to seven children in Kindergarten Mentari School Sidoarjo. The research purpose was to prove the application influence of demonstration learning method toward fine motor ability to autism children in Kindergarten Mentari School Sidoarjo. This research method was quantitative and the data collected was by participant observation and documentation. The participant observation was used to obtain the data of fine motor ability to autism children before and after giving treatment while the documentation technique was as the supporting data or proof that the research was really done. The research result was obtained the data of early observation / pretest data which was obtained among 30,2 and after giving treatment the last observation / posttest data obtained was among 72,9. In this way it could be concluded that counting number Zht = 2,37 was greater than critic value 5% Zt = +1,96. The result indicated that Z counting was greater than Zt (Zht > Zt) which meant Ho was refused and Ha was accepted so that it could be stated that there was significant influence of demonstration learning method application toward fine motor ability to autism children in Kindergarten Mentari School Sidoarjo.

Keywords: Autism Children, Demonstration Learning Method, Fine Motor Ability

A. Introduction

In addition with normal children, children with special need also have a right to get an equal education as same as normal children. According to the Encyclopedia of Disability (2006:257) (quoted in Sujarwanto 2010:1) told about special education had been put forward as follows: “Special education means specifically designed instruction to meet the unique needs of a child with disability”. Special education means designed learning which specifically designed to fulfill the unique needs of children with disorders. For children who have early autism, the provision of education is very essential in order to get initial provision in community. One of the scope developments in the Regulation of National Education Ministry in Indonesia Republic Number 58, 2009 had mentioned that it’s necessary to sharpen the fine motoric skill in early stage. The providing materials should be adjusted with

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age group, this study is given materials for age group around 5-<6 years old, second indicator for fine motoric is 2.3 stringing the beads which were not too small with rather stiff yarn.

According to Reed (1991) (quoted in Sujarwanto 2010:101) Autism is a developmental disorder which affect significantly in both of verbal and nonverbal communication as well as social interaction, generally occurring in children before reach three years old which adversely affects on their performance of children's education. The other opinion also stated that children who have autistic disorder experiencing a very complex issue. These problems are including of motorist, sensory, cognitive, intrapersonal, interpersonal, self-care, productivity and leisure. In this case had been known that autism in children have poor motorist skill and fine motoric skill as well.

The result of observation which had been conducted by researchers in the field obtained the data those children who have autism symptoms experiencing disruption with their fine motoric skill. Fine motoric skill is so necessary, because it's used for daily activities. In early age, fine motoric can be used for several learning activities, such as: children will do task in sticking, cutting, writing, coloring, etc. These activities are relied on small muscle strength in their hands.

In this observation, children facing a problem which is still unable to hold small objects or assembling the small objects in stringing term. This thing is very disturbing for their daily activities, just as children are unable to hold a pencil so they cannot write yet, children cannot be focused on object which they held so the direction is irregular, these things are able to interfere their daily life activities which we can help through the learning process.

The characteristics which had been encountered by researchers in the field is active children, prefer hard to be silent and difficulty to be focused on something, so the teacher find difficulties when explaining the materials to the children. If the teacher are explaining, the children like being active and moving around, so they cannot sitting in their seat. If the teacher forces them to get a sit, then they will be angry and tantrum sometimes. However, the children are already familiar with the instruction. In addition, the children also facing difficulties in holding small objects. If this condition continues, then their learning achievement will be disrupted as well, so it will need an innovation in providing learning to the children.

Currently, innovation in learning process can be done in all of learning aspects, ranging from learning media, learning method, materials or learning sources are can be used as targeted innovation in order to make a learning become more effective and efficient for children, it should be adjusted with the children's condition itself. One of innovation that can be done is applying a learning method which attracts their attention, so the children will focus with the learning process.

According to Sudjana (2005:76) Learning method is a way that the teacher use in establish relationship between teacher and students in learning process. In this situation will need innovation and creativity of teacher in order to attract and motivate the students, so the students can focus in following the learning process. Learning methood has some methods, such as: direct learning method, cooperative learning method, demonstration learning method, etc.

In this study, the researchers use demonstration learning method, according to Muhibbin Syah (2002:208) demonstration method is the teaching method by demonstrating the objects, events, rules and performing sequence in certain activity, either directly or using relevant media which also related with subject or material which were presented. This

method is suitable because has several advantages, such as: student's attention being more centered and observe directly about concrete examples. Therefore, this method is suitable for children who have autism because most of children with autism being more effective using visualization learning. Bright Tots, Inc 2013 stated that "many children with autism are visual learners. The best way to help an autistic child manage change is to understand the way they think, so you can offer ideas and situation to them in a way they will successfully understand" (most of children with autism are visual learners and the best way to help autistic children is understanding about what they think and offering many ideas and situations for them, then they are pointed to get understand well).

From the description above, it's expected that learning innovation can be done by applying this demonstration learning method will increase their motivation and interest in order to follow the learning process, so through this learning method then their fine motoric can be developed as other children. A fun and attention-grabbing learning should be done in order to make children feel comfortable in following the learning process, children also being more motivated to follow the learning as well as their interest to follow the learning is bigger.

With the learning innovation by applying demonstration learning method can be one of solution to overcome this existing problem. This demonstration method can improve their skills in motorist term especially their fine motoric.

B. Literatur Review

In this study used the method of demonstration learning. This method is used because it corresponds to the characteristics of the child. According to Muhibbin, shah (2002: 208) demonstration method is a method of teaching by demonstrating goods, events, rules and sequence of activities, either directly or through the use of instructional media relevant to the subject or material presented. So it can be concluded that the method of demonstration learning is a method that explains concretely the subject matter given either using the original media or artificial media.

According Sujiono, Bambang (2007: 125) states that fine motor movement is a body movement that involves small muscles, such as hand muscles, facial muscles and others. One of the existing scope of development in the Regulation of the Minister of National Education of the Republic of Indonesia Number 58 Year 2009 states that need to train the fine motor skills of early childhood. The material given adapted to age group, in this study was given Material in the age group of three to four years indicator two for fine motor that is 2.3 arranging the beads that are not too small with rather stiff yarn. It can be concluded that fine motor skills are skills using small muscles that exist in certain body parts where in its use requires good coordination.

Yuniar (2002) (in Sujarwanto 2005: 169) suggests that autism is a complex developmental disorder, affecting behavior with the consequences of lack of communication, social and emotional relationships with others, making it difficult to possess the necessary skills and knowledge as members of the community. Children with autism have very unique characteristics when compared with normal children in general. Some characters that appear in children with autism can be known by conducting assessment or identification through the test. In this study, the characteristics observed by researchers is about the fine motor skills of children, children with autism have characteristics that do look different in normal children the same age. Reed (1991) (in Sujarwanto 2005: 180) reveals autistic children experience a very complex problem. These problems include motor, sensory, cognitive, intrapersonal, interpersonal, self-care, productivity, and leisure.

From the previous description it is known that some children with autism have subtle motor development different from other normal children. In this case the child experiences some obstacles or problems such as his movements are rough and less flexible when compared with other children his age. In the process of education activities that can not be separated from these fine motor skills, related things such as writing, cutting, sticking etc. In order that the existing barriers do not interfere with the learning process then need for intervention as early as possible to overcome the problem.

According Muhibbin, Shah (2002: 208) demonstration learning method is a method of teaching by demonstrating goods, events, rules and sequence of activities, either directly or through the use of instructional media in accordance with the subjects or material presented. In this intervention, the method of demonstration learning is appropriate because this method directly shows the material given, this is in line with the way of learning motor skills delivered Aisyah, Siti et al (2007: 4.46-4.47) there are three most common ways to learn motor, learning to try and improve, imitate, and train. This method is suitable because it has advantages such as the attention of students more centered, and also directly observe concrete examples of things. Therefore, the use of this method is suitable for children with autism because most children with autism more effectively use visualization learning. Bright Tots, Inc. 2013 explains that most children with autism are visual learners, the best way to help autistic children is by understanding how they think, so you can offer ideas and situations to them in a way that they will understand well.

With such linkage it is hoped that by providing early intervention of fine motor repair through the method of learning the demonstration of fine motor skills possessed by children can develop as much as possible.

C. Method

1. Type and Research Design

This research uses quantitative research pre experiment design by using "the one group pre-test and post-test design" is an experimental conducted in a group without control or comparison group (Suryabrata, 2002:14)

The paradigm in this experimental research can be described in his following pattern:

$$\mathbf{O_1 \quad X \quad O_2}$$

(Arikunto, Suharsini 2010:124)
Picture 3.1 *One Group Pre-test Post-test Design* Pattern

Explanation:
1. O_1 = *pre-test* observation (score before provide treatment)
2. X = Treatment
3. O_2 = *post-test* observation (score after provide treatment)

The result of pre-test and post-test observation will be analyzed with non-parametric statistic of Wilcoxon " marked-rank test".

2. **Research Location**

In this research, the location which had been chosen for conducting this research is Kindergarten Mentari School, Sidoarjo.

3. **Research Subject**

The subject in this study is autistic students that are amounted to seven students in Kindergarten Mentari School Sidoarjo with this following detail:

Table 3.1 Identity of Research Subject

No	Name	Age	Hindrance
1	DN	6 Years	Fine motoric Skill
2	DF	6 Years	
3	FR	6 Years	
4	MV	6 Years	
5	SK	6 Years	
6	JD	6 Years	
7	RZ	6 Years	

4. **Definition of Variable and Operational**

a. Research Variables

Variables of this research are:

1) The free variable is the variable which become a cause or variable which impacting the occurrence of dependent variable. In this study, the free variable is the demonstration learning method.
2) The dependent variable is the result or occurring effect because of free variable. The dependent on this variable is fine motoric skill in autistic children

b. Definition of Operational

1) The Autistic Children

Autistic children in this study are children who have interference in their fine motoric. The observation's result which had been conducted by researchers in the field obtained the data that children with autism symptoms in the age range around 5-6 years are experiencing the disruption in term of fine motoric

2) The Demonstration Method

Demonstration method is teaching method by demonstrating objects, events, rules and performing sequences of activity, either directly or through the instructional media which relevant with subject materials or presenting materials.

In this study which is demonstrated is several ways to hold objects, taking objects and inserting objects. This research is conducted during one month begins. The steps in this study as follows:

a) Preparation step

1.1) Setting a goals, in this study, the final goal is children with autism can improve their fine motoric skill, especially in these aspects: holding, picking or taking and inserting object
1.2) Preparing the steps of demonstration which will be held, they are how to hold, picking and inserting objects
1.3) Conducting the trials before being demonstration in front of children.

b) Implementation step
1.1) Introduction step
Before start the demonstration, the researchers should set up the seats in such way so the students can observe closely about what is being demonstrated. After the seats are ready, in the beginning of learning, the researchers explain about the purpose of what should be achieved by students, in this case is holding objects, picking objects and inserting objects.
1.2) The Implementation Step of Demonstration
i) Starting the implementation of demonstration with activities which motivate students, so it can create comfortable situation and being ready to follow the learning well.
ii) Ensure that all of students following the demonstration course by observing their reaction
iii) Provide opportunities for students being actively thinking about the further demonstration process.
1.3) Closing Step of Demonstration
After demonstration is over, the children are asked to do the tasks as well as being demonstrated. This thing is able to help determine how far the students following the demonstration process. After the task is complete then performing joint evaluation for improvement in next learning activities.

3) Fine Motoric
Fine motoric is the motion which only uses certain muscles and it's done by small muscles, requiring movement coordination and a good concentration. In this study, the fine motoric skills are observed including of holding objects, picking objects and inserting objects.

5. **Research Instrument**
The research instrument that used in this study consist of
a. Grid of developmental instrument
b. The observation sheets for fine motoric development (pre-test observation and post-test observation)

6. **Data Collection Technique**
In this study use data collection technique is observation and documentation technique.
a. Observation
Observation will include of attention activity to the object by using all of the senses. Thus, observation can be done through sight, smell, hearing, touch and taste. This is also actually the direct observation, Observation research can be done by using test, questionnaires, recorded images and voice (Arikunto, Suharsini, 2010:99)
b. Documentation

Documentation method is the collection of data about things or variables in the form of transcript, book, newspaper, magazine, agenda and so on. (Arikunto, Suharsini, 2003:274)

7. **Data Analysis Technique**

Data analysis technique that used to analyze the data in this study is non parametric statistical data analysis with quantitative data and amount of research sample is smaller than 30 which is n=5 called as small sample. So, the formula is used "Marked-rank test" (Wilcoxon), (Sugiyono, 2013:136)

$$Z = \frac{T - \mu_T}{\sigma_T}$$

Explanation:

Z : the value of test results of rank-marked statistic test

T : the smallest number of step

X : the result of direct observation is the number of plus sign (+) – p (0,5)

μ_T : Mean = $\frac{n(n+1)}{4}$

σ_T : Standard deviation = $\frac{n(n+1)(2n+1)}{24}$

n : Total sample

p : the probability of obtaining the sign (+) and (-) = 0,5 because of the crisis value 5%

8. **Research Result**

a. The Presentation of Data

Based on the research result that had been held, it shows that there is significance influence in the implementation of demonstration learning methods for fine motoric in autistic children. To simplify and understanding the research result, then the research had been presented in tabular form. The data used in analyzing research data as follow:

1) The Result Data of Pre-Test Observation

The result of pre-test observation is value to find out the fine motoric of autistic children before give the treatments. Based on the test results show the average value is 30.2. In this result, the highest score is JD with value in 50 than the lowest score is FR and RZ who have value in 25.

2) The Result Data of Post-Test Observation

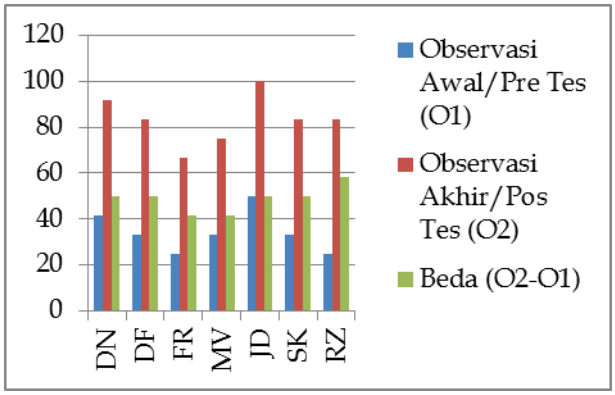
The result of post test observation is the result to find out their fine motoric after being given this treatment in the form of demonstration learning method, based on the result show that there is significance improvement from the average in 30,2 raise to 72,9. In the latest post-test observation, the highest score is JD along with average score 100 than the lowest score is FR along with average 66.67.

b. Recapitulation of Result Data in Pre-Test and Post-Test Observation

Recapitulation is intended in order to determine the comparison of fine motoric ability between after and before having treatments in several aspects: holding objects, picking objects and inserting objects. This is to find out whether there is

improvement in their fine motoric skill in autistic children in Kindergarten Mentari School Sidoarjo

Based on the obtained result, the average is getting increase from 30,2 to 72,9. The significance improvement in each student can be seen on graph 4.1, it shows that the biggest improvement had been seen in RZ with average value 33.33 to 83.33 so it shows differences 58.33.



Gambar 4.1 Graph of Data Result Recapitulation in Pre-Test and Post-Test Observation

9. **Data Analysis**

The data from pre-test and post-test observation are analyzed by using non-parametric statistic with "Marked-rank test" Wicoxon.

The data from research result is pre-test and post-test observation which had been conducted in this research, in order to obtain the data conclusion then the research data should be managed through data analysis technique. Data analysis is the way which been used in simplify data into easier data in order to make it easier to read and present. The analysis which had been used is "Marked-rank test" Wicoxon, with this following calculation:

Based on the result of data analysis from pre-test and post-test observation of fine motoric in autistic children after having treatment can be found out whether there is an influence of demonstration learning method toward fine motoric in autistic children, with mean (μ_T) = 14, and deviation standard (σ_T) = 5,9 if inserted t the formula, then the result is:

$$Z = \frac{T-\mu_T}{\sigma_T} = \frac{T-\frac{n(n+1)}{4}}{\sqrt{\frac{n(n+1)(2n+1)}{24}}}$$

$$= \frac{0-14}{5,9}$$

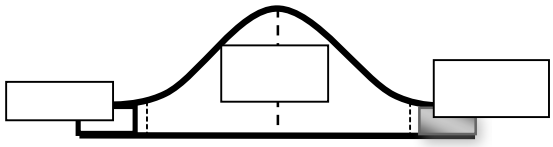
$$= \frac{-14}{5,9}$$

$$= -2,3728814$$

$$= 2,37$$

10. **Testing of Hypothesis**

From the data analysis, Zh=2.37 (value (-) is not taken because its absolute value) bigger than Z value of the table with the critical value of 5% (for the both side tests)= 1,96 is a fact that the value of Zs was obtained in a count is 2,37 bigger than critical value of Ztable 5% ie 1,96 (Zh > Zt), so H_o is rejected and H_a is accepted. This is means that "there is significance influence in applying of demonstration learning method to the fine motoric of autistic children in TK (Kindergarden) Mentari School Sidoarjo". In order to prove the hypothesis result, the study result should be compared with critical value in the tow-sided test curve by comparing the table value and calculated value is illustrated bellow.



Picture 4.2 Testing of Hypothesis Curve

D. Findings/Analysis

Based on the research result when given learning by using demonstration methods for fine motoric skill in autistic children in several aspects, holding, picking and inserting object had been found that there are several changes from the use of this demonstration learning method.

According to J. R. 1976 (quoted in Sanjaya, Wina 2006:126) "in the world of education, learning strategies can be defined as planning which contain of series activities are designed to achieve a articulate education, while implementing a learning strategy, we need a method that is used to implement the designed plan in real activities to achieve the designed goals optimally according to Sanjaya, Wina (2006:147).

The learning is given to the children should be adjusted with characteristic of children learning so the expected result is in line with the expectation that there is improvement in fine motoric skill. Autistic children have visual learning characteristic, so the children will be easier to get information by using picture or body language. This is reinforced by Dettmer, et al, 2000 (quoted in Nirahma & Yuniar 2012:3) stated that individuals with autism disorder are easier to get information visually, looking the characteristic which suit with visual learning, so the provision of treatment which had been used in demonstration learning method by demonstrating a learning activity in front of students, so the children can observe directly and afterward practicing in accordance based on what they seen.

According to the Sanjaya, Wina (2006:152) Demonstration method is the presenting method by demonstrating and presenting toward students about particular process, situation or objects, whether it's real or artificial. As the presenting method, demonstration cannot be separated with verbal explanation by teacher. Although in the demonstration learning method the student's role is only pay attention, however, demonstration can present more concrete lesson materials.

Learning the ways of fine motoric skill according to Aisyah, Siti et al (20017:4.46-4.47) is a way, learn to try and fixing, imitating and training. These things suitable with demonstration method which is demonstrating directly an activity, then from its demonstration the children can try, imitate and train their self to perform the activity which had been demonstrated. By using learning that is used for children learning

characteristic as well as the best way to gave fine motoric skill, in this study shows that there is influence of applying demonstration learning method for fine motoric skill.

Based on the study result, we are able to see the differences obtained from the average of pre-test and post test observation which gain value 30,2 to 72,9 in post-test observation. It can be seen that there is significance improvement, by achieving an average differences between in pre-test and post-test is 42,7. Based on the data analysis result can be calculated that Zhitung= 2,37 bigger than value of Ztable with critical value 5% (for both two-sided tests)= 1,96 is the fact that Z which had been obtained in the count of 2,37 is bigger than critical value if Ztabel 5% is 1,96 (Zht > Zt) so H_o is rejected and H_a is accepted. This is means that there is significance influence of demonstration learning method to the fine motoric of autistic children in Kindergarten Mentari School Sidoarjo. The ability of children increase because in material given, teacher using demonstration learning method in the beginning until end of learning activity then the children is asked to follow the same activities which had been demonstrated before.

E. Recommendation

It is obtained from average value of pre-test observation before applying treatment is 30.2 while the post-test observation after applying treatment is 72.9. It shows that there is significance influence by applying the demonstration learning method to the fine motoric of autistic children in Kindergarten Mentari School Sidoarjo. This is proven by Zcount=2,37 bigger than critical value of Ztable 5% is 1.95 (Zcount > Zt) so H_o is rejected and H_a is accepted.

Based on the research result which had been implemented, it's find out that there is an influence of implementing demonstration learning method toward fine motoric skill of autistic children in Kindergarten Mentari School Sidoarjo, so the authors suggest:

1. In the learning process, we should look the children's characteristic, so it's better to use learning method which suitable for children's characteristic and drawn their attention, so the children will feel motivated following the learning and learning process is more effective
2. In learning process, this is better that teacher setting up a fun learning so it can increase their learning interest and they are easier to receive learning information.
3. In the next study, it will use more samples, different setting of class, and supporting media which had been used as well as different material giving.

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Education and Training Model for the Candidate of Lecturer's State Islamic Religious College (PTKIN) in East Java Province

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Abstract

The quality of lecturers greatly determines the quality and competitiveness of universities.Based on data from Quacquarelli Symonds (QS) World University Ranking 2016/2017 Ranking University in Indonesia (UI) is highest in position 325 this year. While in East Java State Islamic Religious College is ranked 30 national rank while in the world rank 3000.Among other countries rankings of Higher Education in Indonesia is very much compared to other countries. This case shows the competitiveness of universities in Indonesia should be improved, including religious universities. The competitiveness of a college is determined by the quality of the lecturers who teach at the college. In order to form lecturers at qualified state universities, begins with Education and training for prospective lecturers who have recently passed the selection of candidates for civil servants. Based on these problems, the purpose of this research is to develop the model of Education and training for prospective lecturers. The method used is library research with qualitative approach, various data obtained from books, journals, archives, official reports, articles, journals, and online resources on the implementation of education quality standards. The data is also reinforced by field observation. The literature study process consists of three parts. First data collection, second data analysis (using inductive descriptive technique), and the last is making conclusions. In the outcome, the development model of Education and training for prospective lecturers appropriately in East Java can shape the quality of prospective lecturers both in terms of performance and commitment consistently.
Keywords: Candidat Lecturer, Education & Training, Religious Universities

Introduction

Universities in Indonesia today are still less competitive than other countries, even compared with Malaysia and Singapore. The quality of lecturers greatly determines the quality of higher education (Moh Nasir, Minister of Higher Education and Technology). So the quality of Indonesian Universities is determined how far the quality of lecturers who teach. Lecturers have a decisive strategic role in managing a college. In Islamic State Islamic Higher Education, lecturers are Civil Servants who have Certain Functional Positions. In the process of recruitment, every lecturer must pass the education and pre-service training. It aims to form a qualified lecturer, integrity and dedicated during the stint in Higher Education. State Islamic Religious College (UM-PTKIN) is 7 (seven), among them, UIN Sunan Ampel Surabaya, UIN Maulana Malik Ibrahim Malang, IAIN Jember, STAIN Pamekasan, STAIN Kediri, IAIN Tulungagung and STAIN Ponorogo. Almost every year there is always acceptance of candidate of lecturer in each - each PTKIN. Education and training for candidate of lecturer with civil servant status refers to Regulation of the Head of State Administration Institution No 34 of 2014 on Guidelines for Implementation of education and training of civil servants.

In general, various strategic decisions were ranging from formulating the policy to the determination in the institution of state universities involving civil servants with various formations of office. To carry out the role, it takes a professional civil servant, the civil servant

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who appropriate lecturer competency standards so as to perform their duties effectively and efficiently. To be able to form the character of professional civil servants in various positions, functional well, lecturers, teachers, doctors and other positions carried out coaching through the Education and Training (Diklat). This is in accordance with opinion According to Robert and Jackson (2002: 5) that training is a process by which people achieve organizational goals through the assessment and implementation stage of evaluation. Training. Meanwhile, according to Bernadin and Russell quoted by Gomes (2002: 5) training is an attempt to improve the performance of employees at a particular company that is the responsibility

Education and training for candidate of lecturer who have been implemented so far need to be developed in the pattern of implementation. During this training often use a classical learning pattern that tends to lecture and discussion only. This resulted in the learning impressed monoton and bleeding training participants quickly bored Because the prospective lecturer is more critical than the others. So that required development in the implementation of education and training. Innovation in the implementation of Prajabatan Training that allows candidate of lecturer as participants to be able to internalize the basic values of the profession of civil servants by experiencing and doing their own in the application and actualization in each college - each, so that participants feel the benefits directly. Thus the basic values of the civil servant profession is strongly imprinted in him. Through the renewal of Prajabatan Training is expected to produce professional lecturers, which today is needed to manage all the preconditions and resources of existing universities, so as to accelerate the increase of competitiveness.

Education and training for candidate of lecturer in East Java is realized through the policy of the State Administration Institution in the form of preparatory training in forming Government employees Candidates in performing their roles and duties through the improvement of education and training (Regulation of the Head of State Administration Institution No. 15 of 2015). Education and Training is a commitment to improve the quality of candidate of lecturer and meet the needs of work such as facing various problems, challenges and demands of development (Davis, 2005: 34). The philosophy of development innovation Education and training is also aligned with the spirit of bureaucratic reform in the framework of the mental revolution.

Education is intended to foster the ability or develop the thinking ability of the Employees, improve the ability to issue the ideas of employees so that they can perform their duties and obligations with the best Widjaja (1995: 75). Hamalik (2000: 10) describes the training is a process that includes a series of deliberate actions in the form of assistance queue to the workforce provided by professional training personnel in a time that aims to improve the work skills of participants in certain areas of work in order to improve the effectiveness And productivity within an organization. Some of the categories and models of training conducted by government departments and non-departmental agencies are in the form of: pre-service training, in-service training and social service training (training in providing services to the community) . These trainings are based on the concept of job needs and / or self-actualization. The development of training so that the birth of simple training models to complex training models is highly dependent on human culture (society itself). Especially related to the world of education (learning), business, management, technology, society, etc.). (Kamil: 2007)

While the purpose of Training Prajabatan for all Government employees (PNS) aims to form a civil servant who is a civil servant whose character is formed by the value of the basic values of the profession of civil servants, so as to perform their duties and roles professionally as public servants In Government Regulation No. 101 of 2000 on Education and Training of Civil Servant Position (PNS), it was determined that one of the kind of strategic Training to realize civil servant as part of ASN become professional as mentioned above is Prajabatan Training. This training is implemented in order to form the basic values of civil servant profession. This

competence then plays a role in shaping the character of a strong civil servant, the civil servants who are able to behave and act professionally in serving the community.

To form a Government employees, it needs renewal of existing training pattern and supported by all parties. The practice of Prajabatan (Before Position) Training with classical learning pattern dominated by lecture method shows that it is not easy to form the basic values of civil servant profession, especially the internalization process in each participant. Based on the consideration, the innovation in the implementation of Prajabatan Training will enable the participants to be able to internalize the basic values of the civil servant profession by experiencing their own in the application and actualization at the place of duty / place of internship, so that the participants feel the benefits directly. Thus the basic values of the civil servant profession is strongly imprinted in him. Through the renewal of Prajabatan Training is expected to produce professional civil servants, which today is needed to manage all the preconditions and existing development resources, so as to accelerate the improvement of the nation's competitiveness.

Literature Review

Education and training for new employee candidates to master their work while for old employees to improve the work result both now and in the future, increase productivity if got promotion, this is according to that stated by Manullang (2001) that: "education and training of employees Is a work requirement that can be determined in relation to the skills and knowledge based on activities performed on the job. In other words every employee is required to be professional.

According to Sedarmayanti (2011) professional is a pillar that will put the bureaucracy as an effective engine for the government and as a parameter of the apparatus's aptitude in working properly. The measure of professionalism is competence, effectiveness, and efficiency and responsibility. While Siagian (2002) argues professionals are measured from their speed in performing functions and referring to simplified procedures. In Law No 43 Year 1999 Article 1, the management of Civil Servants (PNS) is the overall effort to improve the effectiveness, efficiency and professionalism degree of personnel duties, functions and duties which include planning, procurement of quality developers, placement, promotion, welfare and dismissal,

Design/Procedure

In this research was using literature study method that is problem solving method by studying various data and information through document, book, and research report (Mardalis: 1999). The literature sources used consist of books, regulations, journals, articles, official reports, and other sources of information both in print and electronics. The literature collected relates to education and training management. The results of the literature review are also reinforced by empirical data derived from field observations.

In the study of literature in this study is divided into three important steps namely: data collection, data analysis, and conclusion. Stages of data collection is a stage to select previously collected data covering various sources of literature, while the data used were data related to the implementation of education and training of lecturers candidates whether it is research and thought related to effective education and training management. Furthermore, in the data collection also added data of field observation result on the implementation of education and training. The next process is the process of data analysis, the data has been selected and then analyzed in order to obtain relevant facts to be used as the basis of the preparation of the solution of education problems and pre-service training in Indonesia, while in the process of analyzing this data using inductive descriptive analysis techniques. Descriptive meaningful systematic description of the things studied (Sukardi, 2016: 157) while inductive is the final conclusion technique after the description process implemented. So in this research the data in

the form of descriptive analyzed further until found out the final result of the learning model of Education and pre-service training for candidate of lecturer are appropriately applied in Indonesia. The final process is the preparation of conclusions, based on data analysis results and then concluded the results of the literature review.

Findings/Analysis1. Analysis of Problems of Development of Education and Training

Issues in the development of civil servant education and training must be sought for the root causes. The cause of this problem can be examined from previous research results related to education and training in Indonesia. Revelation Research (2015) on the implementation of education and training referring to the No. 11 of 2011 with 19 training materials and only touch the cognitive aspect (aspect of understanding), while the affective and psychomotor aspects are not considered. Research by Harnold (2009) during the implementation of Prajabatan Training there are some obstacles that do not support the implementation of the training, which of course the limited training building, sometimes Widyaswara not had time to attend the implementation of the training. So it can hamper Training activities held by the Badan Kepegawaian Nasional (Indonesia's National Employees Board). And also Prajabatan Training has not been effective due to widyaswara factors and infrastructure facilities. While other factors such as training participants, curriculum and training process can be concluded quite effectively. Selan the existing facilities and infrastructure is still less conducive, so that participants feel less comfortable with the state of the limited facilities available.

The research on education and training for PN by Abdussamad (2011) in Gorontalo on the development of apparatus human resources shows that the improvement is implemented further through the implementation of a series of structural and functional training. The structural training is a training that is prepared for employees who will occupy certain structural positions, whereas functional training is the training that is prepared for employees who will occupy certain functional positions.

Another study by Labi (2014) mentions didn't no significant change in behavior of pre-service training participants after attending the pre-service training. On the contrary, in some cases CPNS participants after completion of the training and then became a civil servant was disappointing performance. They have begun to be undisciplined and involved in some cases that make them have to deal with law enforcement. Prajabatan training by some of them considered only as a stepping stone to reach the safe point that is as civil servants. Perhaps because as long as they are still CPNS they feel their bargaining position is still not so strong that deviant behavior is hidden or pressed as hard as possible to the subconscious .. This condition certainly does not become the justification that the conditions of education and training prajabatan merely just a formality, Things that need to be studied further for improvement and refinement.

2. Problem Solutions

The analysis based on the results of previous research and empirical facts through observation shows the problems of education and training include aspect of learning implementation, or it can be concluded aspects of management education and pre-service education for civil servants (Lecturer Candidate) becomes an important thing to be developed in overcoming the problems of character formation of candidate lecturer Perguran Tinggi Religious Islam Negeri. This is in line with opinion Monday (2008: 210) Education and training is an activity designed for the learning, knowledge, and skills needed for today's work. Pradana ,. (2013) also reveals Improvements in Education and Training Prajabatan should still be done because Education and Training Prajabatan is the first training conducted by CPNS in order to

become a civil servant. Therefore, To form a good civil servant and able to become an example of society Education and Training Prajabatan need to be improved again the quality.

So far, based on the analysis of previous research results, there must be improvements in the implementation of education and training, because some factors such as lack of understanding and deepening the value of civil servant values, but mainly due to the lack of development model learning education and training used as improvement in its application. As for the appropriate learning design with it, described in figure 1 as follows :

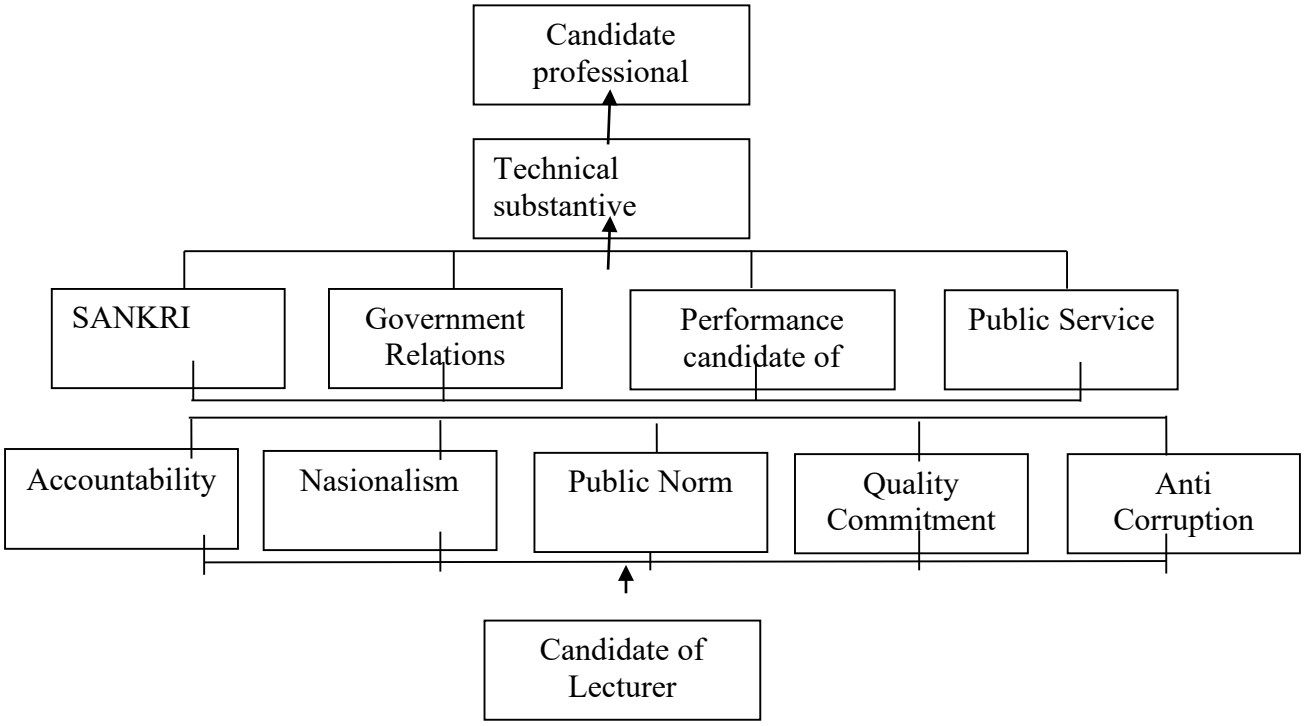

Figure 1. Instructional Design of Education and Training for Candidate of Lecturer

Based on instructional design of education and training of candidate of lecturer, the targeted competence is the formation of professional lecturers in carrying out their profession by prioritizing lecturer competency standards that must be met, in accordance with the Regulation of the Minister of National Education Republic of Indonesia Number 16 Year 2007 About Academic Qualification Standards and Teacher Competencies And Lecturers, which must be owned by teachers and Lecturers, among others: pedagogic, personality, professional and social competence gained through professional education. These are four competencies are integrated in the performance of teachers and lecturers. Besides the competence, the lecturer as civil servant must fulfill the civil servant's command as an accountable and professional public servant by putting forward the attitude of nationalism, having high public ethics standard, and always innovating to develop the quality of college. To fulfill these competencies, the materials of pre-teaching training for candidate lecturers are 5, namely Accountability, Nationalism, Public Ethics, Quality Commitment and Anti Corruption. Based on the explanation, by adjusting field facts through previous research studies and empirical facts, the recommended education and training model is learning and actualization method, ie learning that incorporates classical methods and actualizes in the workplace, so that the duration of the implementation of the ideal pattern of preemployment training increases in length. The total implementation of this pre-service training is 98 working days. The division

is 38 working days on campus (classroom training) and 60 working days off campus (application of workplace training / internship). The application of off campus is a way to explore the affective side of the preemployment training model that provides an autonomous learning system in schools to manage the implementation of ducation and training refers to the improvement of quality in its implementation. So based on this analysis the development model of education and training is shown by the figure 2 below:

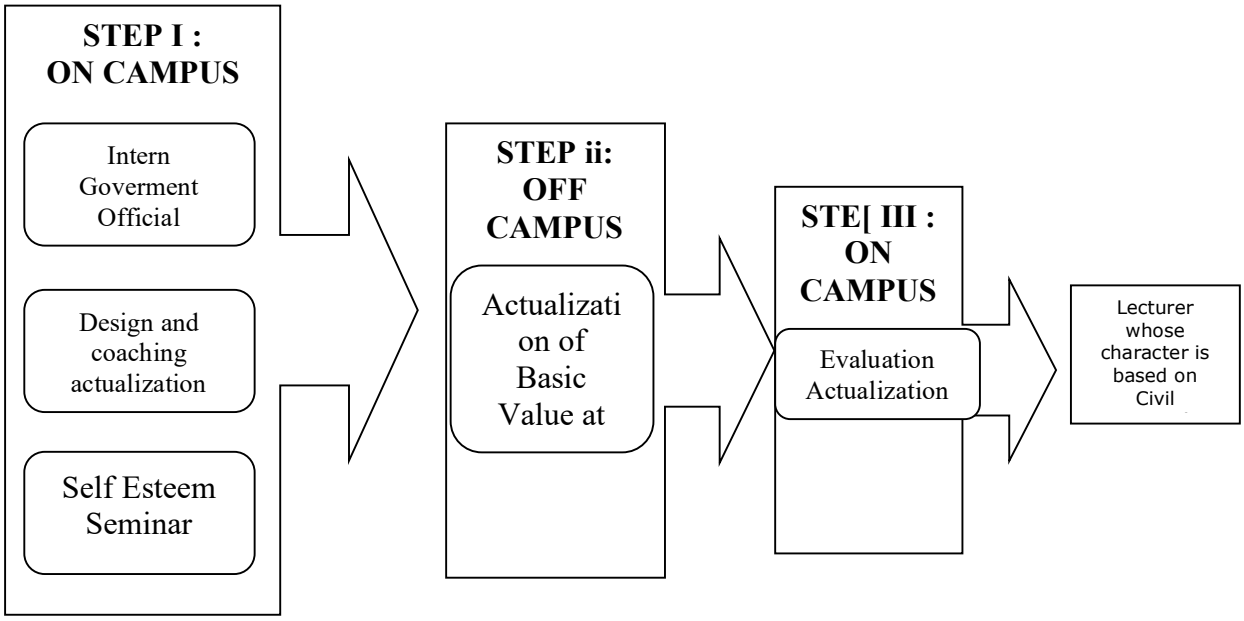

Figure 2: Education Development Model and Lecturer Training of Lecturers

The model of educational development and training for candidate of lecturer implemented by the training institutions is organized in 3 stages, namely:

1. Stage I: On Campus

In this stage I have 3 important activities, namely:

A. Internalization of Basic Value of civil servants, namely the delivery of the training of Accountability, Nationalism, Public Ethics, Quality and Anti-Corruption Commitment (ANEKA) required in carrying out the duties of civil servant profession. The material At this stage is held for 14 days.

B. Designing actualization in the form of writing paper work of various activities based on VALUE values and appropriate tupoksi that will be applied in the workplace participants

C. Evaluation Seminar, conducting seminars by presenting examiners, mentors and coaches to discuss the actualization design that has been prepared based on the basic value of ANEKA

2. Phase II: In Campus

In stage II, students are assigned to actualize activities that have been designed in accordance with the formation of positions based on the basic value of ANEKA in the place of the participants. The actualization phase lasts 13 days.

3. Stage III: On Campus

In this stage III dilakuka evaluation of the actual value of basic professions of candidate of lecturer of civil servants who have been implemented in each college. This evaluation is conducted for 3 days to assess the results of understanding and actualization that has been done.

Assessment is based on the number of activities, relevance, and realization of activities that have been designed

The three stages of learning process in Education and Training Candidate Lecturer (CPNS) are expected to be as in table 1 bellow :

Table 1. Learning Process in Education and Training Candidate Lecturer

Training Subject	Competency
Accountability	Able to actualize the basic values of accountability in the performance of duties of office.
Nasionalim	Able to actualize Pancasila as the basic values of nationalism in the implementation of duties of office
Public Norm	Participants are able to actualize the basic values of public ethics in the performance of their duties
Quality Commitment	Able to understand actions that value effectiveness, efficiency, innovation, and quality-oriented performance, in the administration and public service
Anti Corruption	Forming a trustful, honest, & able attitude and behavior to prevent corruption in their environment.

Recommendation

Education and training for candidate of lecturer (Government employees) in Indonesia that has been held in various government agencies. But in the implementation of the last few years a lot of changes Because of adjusting to the needs and demands of society as the spirit of bureaucratic reform. Based on the results of literature review, found almost every implementation of Education and pre-service training in Indonesia have problems in the learning process, learning methods and facilities and infrastructure. Further implementation of education and pre-service training have not implemented creative and innovative learning process so that the formation of civil servant character has not been effective yet. Responding to this case developed a model of learning Education and pre-service training for candidate of lecturer who emphasize the formation of civil servants characterized by the basic values of civil servants, ANEKA sehinggan training participants who graduated able to perform tasks and roles in a professional manner. By applying the phased pattern of Internalization Stage of Basic Values of Civil Servant Profession and Actualization Stage of Basic Values of Civil Servant Profession then it is expected that experiential learning can give positive impact in the participants. This model involves both parties from BAlai Religious Training, Higher Education and Ministry of Religious Affairs. In addition to such learning stages, participants Training consisting of candidate of lecturer and various other professions, they are also equipped with the ability to explain the vision, mission, main tasks, functions, and policy instansinya in carrying out his position. Training with such a model is expected to produce professional civil servants, because now is needed to manage every government institution, both educational institutions, public services and existing development resources, so as to accelerate the improvement of the nation's competitiveness.

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Power Supply Problems and Safety

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Abstract

This aimed to assess the electric power supply problems as perceived by the electrical consumers; the result of this study will be used as basis for proposed extension package. Factors considered were: electrical household consumers profile as to the type of electric cooperative memberships, combined monthly family income, kind/type and number of electrical appliances, kind and number of electrical lamp, and average monthly electrical consumption; problems related to power supply as perceived by the respondents as to fuel supply, engine breakdown, maintenance operation, and low Voltage. Also considered was the significant mean difference in perception between the consumers and management/maintenance personnel as to the problems met in the electrical power supply distribution and the extension package that could be formulated as to: energy conservation, basic electrical safety practices, house wiring maintenance and skills training program.

Descriptive method of research was used in this study. The questionnaire was used as the main instrument for gathering data and was supplemented by direct observation. Simple percentage computation, weighted mean, and Z-test were employed for the treatment of data.

Majority of the respondents have the residential type of membership while the commercial type has only few. The respondents were able to purchase electrical appliances which they prefer to own and satisfy their needs although they are of low income group. More than eighty percent of the respondents were using fluorescent lamps and only very few were using incandescent lamps. As manifested by the respondents, the energy consumption of almost all household consumers is above minimum and those of commercial type membership consumed more electric power than those of residential type membership.

Keywords: *Power, Safety, Engine Breakdown, Maintenance Operation and Low Voltage*

I. Introduction

Electricity is a necessity in modern day living. From the simplest household to the more elaborate dwellings up to the more complex offices and even the most sophisticated edifices, electricity is one of the foremost requirements. Electricity is needed for lighting. It is used to power household appliances, office equipments, industrial machineries and others, (Fajardo et al.,1994).

Nowadays, electricity becomes an essential part of human life. It provides many valuable things without which life on earth would prove difficult. It enables one to enjoy some comforts. It also facilitates the performance of certain task. Electricity is a form of energy that is situated universally in nature, in space, in the sky, in any living creatures, in a bulk matter, in chemical bonds that hold atoms together in molecules, and in the atoms themselves. Lightning in a high voltage are examples of a large scale presentation of an electrical outcome as natural. In a lesser

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scale, low electrical impulses are transmitted from one nerve cell to the next in animals, giving signals for the brain and other parts of the animal. For the past 100 years, man has established many practices for harnessing electricity and setting it to use for convenience to work. Modern societies have been extremely altered by the idea to produced electric power and transmit it to a long distance for distribution to the consumers. Electric power turns electric motors in an industry, gives edifice and for lighting streets in rural and urban communities, gives life to appliances and illuminations in homes. Electrical phenomena also are the heart of telephone, radio, television, and radar systems Valkenburgh et al., (1987), cited that without electricity, most of the things we use and enjoy today would not be possible.

Electricity also gives an indispensable part in many factories like electroplating of metals, the electric-arc welding of metals, and the use of electrostatic precipitators to eradicate waste from furnace exhausts in a numerous kinds of industrial plants (Encyclopedia Americana, 1997).

Energy consumption every year is increasing due perhaps to the ever increasing population rate, surge of economic growth and expansion. Low voltages and brownouts often experienced by the consumers could delay the many activities of the people involving electricity especially at night time.

Camotes Islands' source of electricity is from the National Power Corporation (NPC) through the distribution by the Camotes Electric Cooperative (CELCO). Considering that Camotes Island is far from the mainland of Cebu and transportation facilities is inadequate, the cost of power supply is high which is brought about by a high cost of transporting crude oil for the machine. With the addition of the Power Purchase Adjustment, the cost of electricity becomes more expensive and will continue to go up with the increase of dollar exchange.

Cebu Technological University San Francisco Campus has been experiencing low voltages and brownouts that hamper the normal operation of the University in its instructional activities which involve the use of machines and other equipment. A broader knowledge on the power supply problems of San Francisco, Cebu may give the school authorities, particularly to the researcher, a better perspective of what extension package they could offer to the community to possibly solve the power supply problems.

II. Materials and Methods

The descriptive method is used since this is a fact – finding study on which scientific judgments is based. The purpose of this method is to describe the status of events, nature of object or subject as they exist at the time when the study was conducted (Calmorin et al., 1999).

The main thrust of the study is to assess the power supply problems of San Francisco, Cebu as perceived by electrical consumers to be used as basis for a proposed extension package. In order to answer the main problem, the inquiries were focused on the input of the study as to the profile of the electrical household consumers as to: type of electric cooperative membership, combined monthly family income, kind/type and number of electrical appliances, kind and number of electrical lamps, average monthly electrical consumption; problems related to power supply as perceived by the respondents as to: fuel supply, engine breakdown, maintenance operation, low voltage.

To answer the inquiries, the questionnaire was used as the instrument for gathering data. Facts not covered in the main instrument were taken through informal interviews, participative observation, ocular inspection, documentary analysis and statistical computation. The output of this study is an extension package on energy conservation, basic electrical safety practices, house wiring maintenance, and skills training program.

The research area is the municipality of San Francisco which is one of the islands in Camotes situated at Northeastern part of Cebu province. The study covered the 15 Barangays of the Municipality of San Francisco, Cebu: Southern Poblacion, Northern Poblacion, Western Poblacion, San Isidro, Unidos, Santiago, Himensulan, Consuelo, Campo, Daan Montealegre, Union, Esperanza, Sonog, Cabonga-an and Sta. Cruz.

The respondents of this study were the members of the Camotes Electric Cooperative of the town of San Francisco, Cebu and the management maintenance personnel where they were randomly selected. The total of 328 respondents for the members of the Camotes Electric Cooperative of the town of San Francisco, Cebu represented 10 percent and out of the 33 management/maintenance personnel, 27 or 81.82 percent were taken as respondents. The overall total of 355 people was taken as respondents of the study where they were randomly selected.

The questionnaire was used as a main tool for data gathering. The first part of the questionnaire gathered data on the profile of the respondent pertaining to: (1) type of electric cooperative membership, (2) combined monthly income, (3) types and number of electrical appliances, (4) types and number of electric lamps, (5) average monthly electrical consumption. The second part inquired about the causes of the problems of the electric power supply distribution as to: (1) fuel supply, (2) engine breakdown, (3) maintenance operation, and (4) low voltages. The third part was mainly about the household tips or technology guide on energy conservation and basic electrical safety practices. The fourth part is about the skills training program.

Before fielding out the questionnaire to the respondents, this was submitted for checking and validation to the adviser and subsequently to the thesis advisory committee. After the revisions, the researcher reproduced the instrument to the desired number of respondents. He then contacted and interviewed the identified respondents. Interview also served as guide for data gathering. In cases where the respondents were found short in understanding English language, the researcher translated the questions in the Visayan dialect. Direct observation was also used to substantiate the interview.

Before the instrument was administered, a written permit was first secured from the Barangay Captain of the different barangays to conduct a survey of their respective barangay and from the Camotes Electric Cooperative (CELCO) manager the purpose of which is to get the authority. The instrument was personally administered by the researcher. The respondents were given ample time to answer the questionnaire after which it was collected by the researcher. An informal interview was then made to supplement facts not taken in the instrument. A survey of the vicinity was also made by the researcher to gather more information needed. The data gathered were tallied, collated, tabled and subjected to the following statistical computation.

III. Results and Discussion

The profile of the household consumers include the type of electric cooperative membership, combined monthly family income, kind/type and number of electrical appliances, kind and number of electrical lamps and average monthly electrical consumption. The problems related to electric power supply distribution as perceived by the respondents as to: lack of fuel supply, engine breakdown, maintenance operation, and low voltage. Almost all household consumers' energy consumption is above minimum and that about one half consumed between the range of 61 to 120 KWH monthly. The findings stress further that those of commercial type membership consumed more electric power per month than those of residential type membership.

This discussion focused on some problems related to power supply distribution as perceived by the respondents as to fuel supply, engine breakdown, maintenance operation and low voltage.

Fuel Supply

Delay in the delivery of fuel due to inclement weather condition got a weighted mean of 2.68, delay in the purchasing of fuel, 2.58 both described as Always Experience. No transportation facilities available has a weighted mean of 2.27 and is described as Sometimes Experienced. The average weighted mean is 2.51 with a verbal description of Always Experienced.

While the management / maintenance personnel responses, Delay in the delivery of fuel due to inclement weather condition got a weighted mean of 2.70, described as Always Experience. No transportation facilities available got a weighted mean of 1.96, and delay in the purchasing of fuel with a weighted mean of 1.52 both is described as Sometimes Experienced. The average weighted mean is 2.06 with a verbal description of Sometimes Experienced.

Further scrutiny entails that the consumers' and the management / maintenance personnel differ in their perception. The consumers always met problems in electric power supply distribution as to fuel supply while the management/maintenance personnel met sometimes.

The computed value as to the problems met by the respondents in the electric power supply distribution as to Fuel Supply is 3.91, which is greater than the table value of 1.96.

The findings rejected the null hypothesis of no significant mean difference between the perception of the consumers and management/ maintenance personnel as to fuel supply. The findings signify that both consumers and management/ maintenance personnel differ in their perception on the problems met as to fuel supply because the computed value of the test of significant mean difference is greater than the table value.

Engine Breakdown

Engine breakdown is due to any part that is damaged and no longer functioning. The consumer respondents in the electric power supply distribution as to engine breakdown. Fuel trouble due to faulty filter, got a weighted mean of 2.42, starter fails to work, a weighted mean of 2.38, shorted electrical wiring, weighted mean of 2.32, and all is verbally described as Sometimes Experienced. The total weighted mean is 2.37 with a verbal description of Sometimes Experienced.

The management / maintenance personnel responses on the other hand were all verbally described as Sometimes Experienced such as Shorted electrical wiring, with a weighted mean of 1.63, Fuel trouble due to faulty filter, with a weighted mean of 1.55, and Starter fails to work, with a weighted mean of 1.52. The average weighted mean of the responses of the management / maintenance personnel is 1.57 and is described as Sometimes Experienced.

Further reveals that both the consumers and the management / maintenance personnel sometimes experienced problems regarding power supply distribution due to engine breakdown.

The computed value as to the problems met by the respondents in the electric power supply distribution as to Engine Breakdown is 7.19, which is greater than the table value of 1.96.

The findings rejected the null hypothesis of no significant mean difference between the perception of the consumers and management/ maintenance personnel as to engine breakdown. The findings signify that both consumers and management/ maintenance personnel differ in their

perception on the problems met as to engine breakdown because the computed value of the test of significant mean difference is greater than the table value.

Maintenance Operation

The problems met by the consumers in the power supply distribution as to maintenance operation which are described as Always Experienced were: Rotten electrical post with a weighted mean of 2.68, clearing of vegetation underneath electrical wire with a weighted mean of 2.64. Faulty transformer with a weighted mean of 2.29 is described as Sometimes Experience. The average weighted mean is 2.54 and is verbally described as Always Experienced with a standard deviation of 0.65.

As to the management/maintenance personnel responses which described as Always Experienced were rotten electrical post with a weighted mean of 2.59, and clearing of vegetation underneath electrical wire with a weighted mean of 2.55. Faulty transformer with a weighted mean of 2.41 is described as Sometimes Experienced. The average weighted mean is 2.52 and is described as Always Experienced with a standard deviation of 0.62.

The result indicates that the information obtained from the community consumers with an average weighted mean of 2.54 is almost the same with that from the management / maintenance personnel with an average weighted mean of 2.52, both were verbally described as Always Experienced.

This reveals that the computed value as to the problems met by the respondents in the electric power supply distribution as to Maintenance Operation is .16, which is lesser than the table value of 1.96.

The findings accepted the null hypothesis of no significant mean difference between the perception of the consumers and management/ maintenance personnel as to maintenance operation. The findings signify that both consumers and management/ maintenance personnel have a parallel perception on the problems met as to maintenance operation because the computed value is lesser than the table value of the test of significance mean difference.

Low Voltage

The responses from the consumers which were verbally described as Always Experienced such as: Overloading the equipment or conductors with a weighted mean of 2.59, short circuit between line one and line two got a weighted mean of 2.78, and ground fault with a weighted mean of 2.61. The average weighted mean is 2.66 with a descriptive rating of Always Experienced.

The responses of the management / maintenance personnel were verbally described as Always Experienced such as: Overloading the equipment or conductors with a weighted mean of 2.63, and ground fault with a weighted mean of 2.67. Short circuit with a weighted mean of 2.22 and described as Sometimes Experienced. The average weighted mean is 2.51 and described as Always Experienced.

The findings reveal that the responses between the consumers and the management / maintenance personnel shows that low voltage of electric power supply always exist in the community.

The computed value as to the problems met by the respondents in the electric power supply distribution as to Low Voltage is 1.15, which is lesser than the table value of 1.96.

The findings accepted the null hypothesis of no significant mean difference between the perception of the consumers and management/ maintenance personnel as to low voltage. The

findings signify that both consumers and management/ maintenance personnel have parallel degree of perception on the problems met as to low voltage because the computed value is lesser than the table value of the test of significance mean difference.

IV. Conclusion

There is an existing power supply problems as to fuel supply, engine breakdown, maintenance operation and low voltage. On this regard, there is a need for the community to upgrade or enhance their knowledge and ability to conserve energy, take safety measures in handling electricity at home. To make this possible, the Cebu Technological University San Francisco Campus, San Francisco, Cebu in line with their mission could package and extension program to the community.

V. Recommendations

Based on the findings and conclusions in this study the following recommendations are suggested:

1. There is a need for the consumers and management/maintenance personnel to have a collaborative endeavor in minimizing if not eliminating the source of the problems met in the electric power supply distribution especially in the maintenance operation.
2. There is a need for educational upgrading both the consumers and the management/maintenance personnel in terms of safety measures and energy conservation.
3. The proposed skills training program of activities should be given due consideration by the Cebu Technological University San Francisco Campus, San Francisco, Cebu for immediate implementation.
4. Household tips on safety measures should be distributed by the management/maintenance personnel to the consumers.

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Structural Conduciveness of National High Schools in Camotes Island Philippines: Basis for Empowerment

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Abstract

This is a descriptive study utilizing researchers' made questionnaire looking into the structural conduciveness of the National High Schools in the municipalities of San Francisco and Pilar, Cebu, Philippines basis for improvement of performance through positive change. This is in line with the educational thrust on "Global Competitiveness".

Out of 46 teachers only one possesses master's degree. Most of them have teaching experience ranging from 25-30 years. There were 91.30% has average knowledge and skills with respect to motivating others, 93.48% has the mental readiness to lead and participate on work team, 69.57% has moderately favorable attitudes in working cooperatively with other members, 23.26% has a becoming an empowering managerial and leadership skills and attitudes, 52.17% has average tendency to play politics, 54.35% is favorable with team style while 45.65% authoritarian on leadership skills, 75% has normal amount of Stress, 45.65% is in the right track but with more flexibility which could benefit the ability to deal with change, 73.91% is moderately risk takers, and 60.87% of the teachers felt a higher level of trustworthy behaviors and attitudes.

The behavior of teachers met the average standards. However, in the managerial and leadership skills and attitudes there is a need to enhance through additional units in the master's degree courses. Hence, they become more productive, effective and efficient that consequently leads to a more desirable teaching and learning environment.

It is recommended to motivate teachers to pursue post graduate studies in line with their specialization.

Keywords: *Structural conduciveness, National High Schools, Descriptive Study, Empowerment*

Introduction

Organization refers to the collection of people working together to achieve a common purpose. It lay out like a network, emphasizing horizontal specialization, extensive use of personal coordination, extensive communication among members, and loose rules, policies, and procedures, (DuBrin. 2009). Conduciveness refers to the positive contribution of the elements of an organization to achieve its purpose.

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Organizational relates to the process of measuring the development of the "culture" of an organization. It is a set of properties of the work environment, perceived directly or indirectly by the employees, that is assumed to be a major force in influencing employee behavior,

Organizational climate denotes to the degree to which an organization give attention on the improvement, elasticity, gratefulness and appreciation, apprehending for the welfare of every worker, continuing education and advancement, social responsibilities and integrities, quality performance, contribution and authorization, and governance, (http://greatworkplace.wordpress.com/2009/09/01/what-is-organizational-climate-and-why-should-you-warm-up-to-it, September 2011). Developing the skills of the workers means great contribution to the success of an organization.

The prevalence of disagreements such as role confusion, deficiency in harmonizing among the function, and the absence of brainstorming slows down the process of making decision which could result to complexity, stress, and conflict.

People who join in a work group become part of the organization's social system. Organizations require consistent levels of high performance from their employees in order to survive in a highly competitive global environment, (Newstrom. 2007). The success and failure in the operation of the organization defends upon the conduciveness of its structure.

The central purpose of this study is to look into the structural conduciveness of the National High Schools in the municipalities of San Francisco and Pilar, Cebu as Basis for Empowerment. Specifically aim to find out the educational qualification and experience of the teachers. The teachers' perception of the organizational behavior in terms of motivating others, mental readiness, team player attitudes, leadership behavior and style, empowering attitude or behavior, positive organizational politics, stress, flexibility, risk taking, and trustworthy behavior and attitude. The result would be the basis for the improvement of performance through positive change. This is in line with the educational thrust on "Global Competitiveness".

Materials and Methods

This is a descriptive study using survey questionnaire as a tool for data gathering that cover the six (6) National High Schools in the municipalities of San Francisco and Poro in Camotes Islands situated at the Fifth District of the Province of Cebu, Philippines. Before the questionnaire was distributed, the researchers get the number of teachers from each school.

This study considers two kinds of variables: independent and dependent. The independent variables embrace the profiling of the teachers such as their educational qualifications and experience.

The dependent variables are the teachers' perception of the organizational behavior in the six National High Schools, three from the municipality of San Francisco and Three from the municipality of Pilar in terms of motivating others, mental readiness, team player attitudes, leadership behavior and style, empowering attitude or behavior, positive organizational politics, stress, flexibility, risk taking, and trustworthy behavior and attitude.

The outcome of the study consists of the implications for students, teachers, and school administrators.

This also proposes measures in order to improve the organizational behavior of the different national high schools in the three districts of Camotes Islands.

Result and Discussion

Profile of Teachers

The profile of teachers' respondents includes highest educational attainment and teaching experience.

Table 1
Highest Educational Attainment of Teachers
n=46

Educational Attainment	Frequency	Percentage
Masters' degree (MAEd)	1	2.2%
BS degree only	45	97.8%
Total	46	100

The table shows only one (1) teacher is a master's degree holder and rest has BS degree only. This implies that teachers are not encouraged to take post degree courses.

Table 2
Teachers Teaching Experience
n=46

Teaching Experience	A F	B F	C F	D F	E F	F F	Total	%
31 years and above				1			1	2.18
25- 30 years		3	6	2	2	3	16	34.78
20 -24 years	1					1	2	4.35
15 – 19 years	2			2		2	5	10.87
10 – 14 years	2				1		3	6.52
5 – 9 years	1	3	1	3	1	2	11	23.91
4 and below		3	2	3			8	17.39
Total	6	9	9	11	4	7	46	100

The table shows that most of the teachers have teaching experience ranging from 25 – 30 years of 34.78% followed by 5-9 years of 23.91 %. This implies that 34.78 percent of teachers' respondents are already seasoned in teaching while 17.39 percent are still experiencing.

Perception of Teachers' on the Structural Conduciveness

Table 3
Motivating Others
n=46

School	Advanced		Average		Needs Improvement	
	F	%	F	%	F	%
School A	1	2.174	5	10.87	0	0
School B	0	0	9	19.57	0	0
School C	1	2.174	8	17.39	0	0
School D	0	0	10	21.74	1	2.174
School E	0	0	4	8.69	0	0
School F	0	0	6	13.04	1	2.174
Total	2	4.35	42	91.30	2	4.35

The table shows the data to describe how often teachers' respondents act or think in a way of attempting to motivate another person. This implies that 91.30 percent of the teacher respondents possess average skills and abilities with respect to motivating others. With continuing professional development in a form of seminar and schooling could possibly improve their motivational abilities and help co-teachers to be motivated to work hard for a conducive organizational structure.

Table 4
Mental Readiness
n=46

School	High Degree		Needs Improvement	
	F	%	F	%
School A	6	13.04	0	0
School B	9	19.57	0	0
School C	9	19.57	0	0
School D	9	19.57	1	2.174
School E	3	6.52	1	2.174
School F	7	15.22	1	2.174
Total	43	93.48	3	6.52

The table shows the mental readiness of the teachers' respondents. This implies that most or 93.48 percent have higher mental readiness to lead or participate on a work team.

Table 5
Team Player Attitude
n=46

School	Strong Positive		Moderately Favorable		Not Favorable	
	F	%	F	%	F	%
School A	4	8.70	2	4.35	0	0
School B	2	4.35	7	15.22	0	0
School C	2	4.35	7	15.22	0	0
School D	1	2.17	8	17.39	2	4.34
School E	0	0	4	8.695	0	0
School F	0	0	4	8.695	3	6.52
Total	9	19.57	32	69.57	5	10.86

The table reflects the team player attitude of the teachers' respondents. It shows that 69.57 percent possess a moderately favorable attitude as member of the team supportive to each other. Only few of them have strong positive attitude and a not favorable attitude which when to effectively work in a school should demonstrate teamwork. This implies that teachers need to improve and advance approaches to work cooperatively with the members of the team.

Table 6
Leadership behavior and Style
n=46

School	Participative		Authoritative	
	F	%	F	%
School A	5	10.87	2	4.35
School B	5	10.87	3	6.52
School C	2	4.34	7	15.22
School D	5	10.87	7	15.22
School E	4	8.70	0	0
School F	4	8.70	2	4.35
Total	25	54.35%	21	45.65%

That table reflects the style of leadership teachers' respondents are. Although More than half of the teachers are participative, it shows about half of them are authoritative teachers. As facilitator of learning this implies that they are traditional teachers.

Table 7
Empowering Attitude or Behavior
n=46

School	Can do		Needs to Develop	
	F	%	F	%
School A	4	8.70	2	4.348
School B	5	10.87	4	8.896
School C	5	10.87	4	8.896
School D	6	13.04	5	10.87
School E	2	4.35	2	4.348
School F	3	6.52	4	8.896
Total	25	54.35%	21	45.65%

The table shows 54.35 % of teachers' respondents have empowering attitude and behavior while 45.65% needs to develop the skills to empower members to improve productivity, quality and satisfaction.

Table 8
Positive Organizational Politics
n=46

School	Below Average		Average		Above Average	
	F	%	F	%	F	%
School A	0	0	5	10.87	1	2.17
School B	7	15.22	2	4.35	0	0
School C	2	4.35	3	6.52	4	8.70
School D	7	15.22	4	8.696	0	0
School E	4	8.69	0	0	0	0
School F	2	4.35	4	8.696	1	2.17
Total	22	47.83	18	39.13	6	13.04

Table 8 shows the positive organizational politics. As reflected in the table 47.83 percent or almost half of the respondents are not aiming to hold more power, 39.13 percent of them are moderately political which implies that they probably could be a successful leaders.

Table 9
Stress
n=46

School	Normal		High		Much too High	
	F	%	F	%	F	%
School A	5	10.87	0	0	2	4.35
School B	9	19.565	0	0	0	0
School C	4	8.695	2	4.35	3	6.52
School D	6	13.04	3	6.52	2	4.35
School E	4	8.695	0	0	0	0
School F	6	13.04	1	2.17	0	0
Total	34	73.91	6	13.04	7	15.22

The table shows that 73.91 percent of the respondents have normal amount of stress. This implies that they are not pressured in their job or probably have the skills in managing stress

Table 10
Flexibility
n=46

School	Often		Sometimes		Rarely	
	F	%	F	%	F	%
School A	4	8.695	1	21.17	1	2.174
School B	0	0	5	10.896	4	8.695
School C	2	4.35	4	8.695	3	6.52
School D	3	6.52	5	10.896	3	6.52
School E	0	0	4	8.695	0	0
School F	0	0	5	10.896	2	4.35
Total	9	19.57	24	52.17	13	28.26

The table shows 52.17 percent of the respondents have sometimes flexible attitude, an ability to be open to others, and a willingness to listen. This implies that they are on the right track, but more flexible would benefit the ability to deal with change. The 19.57 percent respondents have a long way to go to improve flexibility and adaptability to change and the 28.26 percent are unusually adaptable and therefore probably cope well with change.

Table 11
Risk Taking Skills
n=46

School	Moderate Risk Taker		Cautious	
	F	Percentage	F	Percentage
School A	6	13.04	0	0
School B	6	13.04	3	6.52
School C	5	10.87	4	8.70
School D	7	15.22	4	8.70
School E	4	8.70	0	0
School F	6	13.04	1	2.17
Total	34	73.91	12	26.09

The table shows that 73.91 percent of the respondents are moderately risk taker and only 26.09 percent cautious. This implies that they take risk in their pursuit of higher productivity and effectiveness.

Table 12
Trustworthy Behaviors and Attitudes
n=46

School	More Trustworthy		Less Trustworthy	
	F	%	F	%
School A	5	10.87	1	2.17
School B	4	8.695	5	10.87
School C	5	10.87	4	8.70
School D	5	10.87	6	13.043
School E	4	8.695	0	0
School F	5	10.87	2	4.35
Total	28	60.87%	18	39.13

The table shows 60.87 percent of the respondents are more trustworthy which implies that they could be trusted by others that is an asset of their career.

Summary of Findings:

Based on the data gathered and collated, it shows that most of the teachers have teaching experience ranging from 25 – 30 years of 34.78% followed by 5-9 years of 23.91 %. Most of them are Baccalaureate Degree Holder.

There is 91.30 percent of the teacher respondents possess average skills and abilities with respect to motivating others. With continuing professional development in a form of

seminar and schooling could possibly improve their motivational abilities and help co-teachers to be motivated to work hard for a conducive organizational structure.

There is 93.48 percent higher mental readiness to lead or participate on a work team.

Finding shows that 69.57 percent possess a moderately favorable attitude as member of the team supportive to each other. Only few of them have strong positive attitude and a not favorable attitude which when to effectively work in a school should demonstrate teamwork. This implies that teachers need to improve and advance approaches to work cooperatively with the members of the team.

More than half of the teachers are participative, it shows about half of them are authoritative teachers. As facilitator of learning this implies that they are traditional teachers.

There is 54.35 % of teachers' respondents have empowering attitude and behavior while 45.65% needs to develop the skills to empower members.

There is 47.83 percent or almost half of the respondents are not aiming to hold more power, 39.13 percent of them are moderately political.

It was found that 73.91 percent of the respondents have normal amount of stress.

It shows a 52.17 percent of the respondents have sometimes flexible attitude, an ability to be open to others, and a willingness to listen. This implies that they are on the right track, but more flexible would benefit the ability to deal with change. The 19.57 percent respondents have a long way to go to improve flexibility and adaptability to change and the 28.26 percent are unusually adaptable and therefore probably cope well with change.

There is 73.91 percent of the respondents are moderately risk taker and only 26.09 percent cautious.

There is 60.87 percent of the respondents are more trustworthy which implies that they could be trusted by others that is an asset of their career.

Conclusion:

Based on the findings, it is safe to conclude that the behavior of teachers met the average standards. They have sufficient experience in the field of teaching and they possess the abilities needed of a teacher. Most of them are flexible and moderately risk takers so that can readily cope with change. However, in the managerial and leadership skills and attitudes there is a need to enhance through trainings, seminars and schooling. An additional unit in the master's degree courses is of great advantage. Hence, they become more productive, effective and efficient that consequently leads to a more desirable teaching and learning environment.

Recommendation:

It is recommended to send teachers to seminars and trainings and motivate them to pursue post graduate studies in line with their specialization.

Citation

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The Secondary School Students' Representations of Isomerism

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Abstract

The concept of isomer is one of the most important of chemistry concepts due to its fundamental foundation of organic chemistry. This study aims to survey students' representations of Isomerism. The target group was 25 of high school chemistry students who were studying in the first semester of 2017 academic year. The survey was open-ended question. Students were required to draw an isomer of the molecule with its explanation. Students' answers were classified and grouped based on their drawing and its explanation. The results show that all students (100%) were able to draw only one type of molecular structure. Almost all students (96%) were not able to explain the relationship between the formula and its isomer structures. Moreover, all students (100%) were not able to distinguish the different of chemical structures and its isomer. From these results, it reflects to lack of understanding of chemical bonding, which is the important prior knowledge.

Keyword: *Representation, Drawing, Isomerism, High School Chemistry*

Introduction

Science is relevant to everyone in everyday life and work, as well as technology, tools, appliances and productivity. Science helps us develop the way ideas are thought, creativity, and critical thinking, this including ability to solve problems systematically. High school education has focused on increasing the knowledge and skills. Advanced thinking skills knowledge can be applied to the benefits of continuing education and occupation. (Ministry of Education, 2008).

Learning management to provide learners with the required knowledge in core curriculum. The basic principle is that learners are most important by believing that everyone has the ability to learn and develop themselves, the benefits to the students. The learning process must encourage the learner, develop naturally and fully according to potential and considering the differences between individuals and their development. So learning-focused learning is important. Learners will need a variety of learning processes as a tool to guide them toward their goals. Science Learning aims to provide students with a science that focuses on linking knowledge to the process, have the skills to research and create knowledge, using the process of inquiry and a variety of solutions, allow learners take part in learning every step. There is a variety of practical activities to suit the class (Ministry of Education, 2008).

Chemistry is a subject in science, but many concepts in chemistry are abstract and invisible. So many students have misconceptions and incompletes about chemistry. Current learning in chemistry has developed a learning medium that allows students to develop molecular menthol models closer to scientific concepts and can relate relationships between conception in

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molecular levels with macro levels and symbolic levels. These can help students learn chemistry more efficient (Supasorn, 2012). Explaining chemical phenomena to students is difficult because it is abstract or unseen (Johnstone, 1993). So chemists describe behavioral change in three levels; macroscopic level, sub-microscopic level and symbolic level. At the macro levels can be observed such as the change of matter. At the sub-microscopic level is described at the molecular level such as the movement of molecules and in symbolic levels such as symbols that represent atoms, molecules, compounds, chemical symbols, formulas, and structures. The study found that learning at a sub-microscopic level and symbolic level is difficult for students because it is something that cannot be seen and is bstract while the student relies on sensory input to understand the data so learning in macroscopic is so that students can most easily understood (Wu and et al., 2000). In the teaching of isometrics, most students have a poor understanding of concepts or incomplete .The study (Nalan Akkuzu & Melis Arzu Uyulgan, 2016) found that students could not fully understand general chemistryabout molecular structures make students unable to link knowledge to organic chemistry. In order to promote the understanding of the students we should organize various learning activities.

The concept of isomerism of organic chemistry are found as one of the most difficult topics for high school students. In spite of the concepts are fundamental to understanding the substance and its properties. Therefore the researchers are interested in survey students' thinking and representation of isomerism. So that the instructor have an information of how students think of isomerism. The data will be benefit for teacher as a guide for the development of conceptual understanding in this particular concepts.

Objectives

To survey the representations of isomers of Mathayomsuksa 6 students.

Definition

1. Representation is an expression of particular ideas to others.

2. Representation of isomerism is what students draw the structure or the explanation, what students understand about isomerism.

3. The test is an open-ended question of isomerism.

4. Students are 26 of Mathayomsuksa 6 students, who are studying in 2017 academic year of Phakdee Chumpon Witthaya School. The secondary education service area office 30.

Scope

1. The research site is Phakdee Chumpon Witthaya School. The secondary education service area office 30.

2. The sample of this research was 26 of Mathayomsuksa 6 students who were studying chemistry in the first semester academic of 2017.

3. The chemistry concept was isomerism of organic chemistry.

Methodology

Research Design

A survey study was employed to collect the representations of isomerism.

Sample group

The sample group consisted of grade 12 students in the first semester of the academic, Phakdee Chumpon witthaya School Amphoe Phakdee Chumphon, Chaiyaphum Province, 26 people selected by purposive sampling.

Variable

Representations of isomerism

Research tools

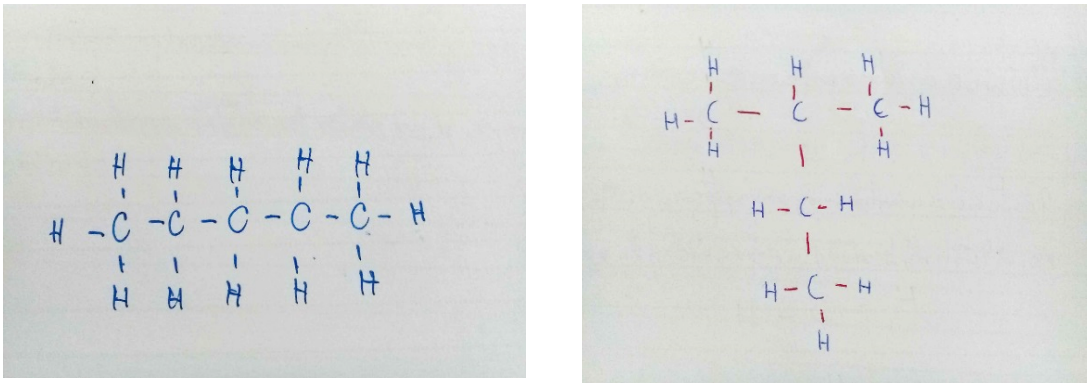
Three open-ended questions with drawing and its explanation were decided as a tools to collect data.

Data collection

Test with sample students by means of isomerism tests and then group the answer.

Data analysis

Based on the students' representative discussion of Problem 1, students write the isomers of the following structural formula C_5H_{12} and explain how students think of isometric. Each one found that the 100% students drew only one structural formula of C_5H_{12}, which was written as a Lewis structural formula, with 96% students writing the formula as a figure a another 4% wrote the formula in figure b. Twenty-one students describe C and H bonds. Most students understand the bond between C and H but there are some students explain the incorrect covalent bonding. There are 7 students who say that the formula they wrote is a simple, easy to read C_5H_{12}'s isomer formulas can be written in many forms but all students write in only one form. One student misconception by saying that C is substrate in structure and only one student said about the molecular formula and structural formula, but the students did not tell the relationship between molecular formula and structural formula.



a b

Figure 1 shows an example of Lewis structured of isomerism of C_5H_{12} drawn by students.

Table 1 Students' representative of isomerism expressed by the explanation.

Student answers	**Sample student answers**
Describe the covalent bonds of C and H	"C_5H_{12} has C 5 atom and H 12 atom and C is 4 arms, 4 arms are missing, 4 arms have to write C together to add arm to C and H has 1 arm to write with C all 4 arm"
Writing is easy and easy to understand.	"To write each structure, we must first see which element group and want or not such as C is group 4 has four arms etc. From the substance that C_5H_{12} can be written as shown above, C has 4 arms H with one arm and a structure that *can be easily written and understood.*"
Can be written in various ways	"Based on the given problem C_5H_{12}, let us take C to 5 together, using a single bond, H of 12, to C with a single bond and *write multiple isomers*"

Student answers	**Sample student answers**
The substrate is C	"*C_5H_{12} substrate is C,* so we have to place carbon is C before, C has 5 atom for the answer to choose C is a long line because it is put H is easy, H has 12 atom put the top and bottom of each carbon. All 10 can be reduced, the other two can be put on the edge of carbon."
Molecular and structural formula	"*Isomers are the same organic molecules but different structures*"

Table 1 shows the answers of the students who answered question 1 and the sample of the respondents to each answer.

Question 2 is a question about the difference of three structural isomers. From the test, it appears that most students said that what makes the three substances is isomers because of their position of different bonding. Some students said that all three substances have the same amount of atoms, the molecular formula is the same but the formula is different, there are different atomic positions, different types of bonds such as single bond, double bond, and triple bond. Some students have misconception by students said that the amount of atoms other structural isomers is not equal or all three substances are the same substance. From the results of the students' quizzes, there are no students who focus on other functional group than alkenes.

The results of the third test, which is a question about the difference between cis-trans isomers. Most students value the position of atoms or atoms that are attached to the alkene. As a result of the tests, most of the students identified the first isomers of cis-isomers and the second isomer is a trans-isomer. However, some students identified both isomers as the same isomer. For example, both are cis-isomers structures or are trans-isomers.

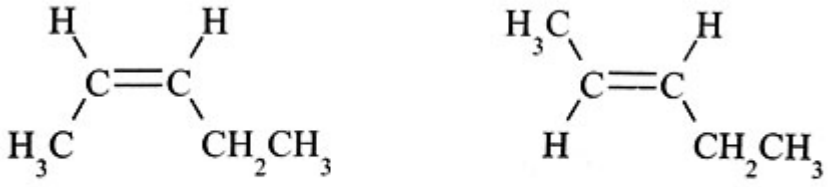


Figure 2 Structures show the difference between cis-trans isomer.

Summarize and discuss the results.

The study indicated that from question 1 about C5H12 isometric writing, all students write a formula of C5H12 which is written in a Lewis formula. Most students describe the isomers written about the covalent bonding of C and H with only one student referring to the molecular formula and the structural formula but students have yet to explain the relationship between molecular formula and structural formula. Question 2 is a question about isomer differentiation. Three types of structures most students said that what makes these three substances are isomers because they have different bonding positions no students who focus on other functional group than alkenes. The third question about the difference between cis-trans isomers. Most students value the position of an atom or an atom that is attached to an alkene. Most students report that the first type of isomers are cis - isomers and the second isomer is a trans-isomer but some students indicate that the two isomers are the same isomer, such as both are cis-isomers structures or are trans-isomers.

Suggestion

From this study, the researcher has the following suggestions.

1. The study found that students show some understanding of isomerism, but not completely accurate. The results of this study suggesting the development of teaching and learning to develop conceptual understanding of isomerism of students, especially to the chemical bonding concept.

2. Students have diverse presentations to different isomers. Students are not able to apply the concepts of isomerism to different isomers.

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A Square Peg in a Round Hole: Township Learners' Situatedness at Historically White Schools in the Northern Cape

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Abstract

The advent of democracy in South Africa paved the way for black township learners to gain access to schools that previously only catered for white learners. The new democracy and concomitant admission of township learners at historically white schools was not without serious challenges for these learners, as their new school environment differed remarkably from that of their home. Finding a niche in these opposing worlds proved not only difficult, but also perplexing for these learners. The situation essentially meant that township learners were now confronted with the predicament of actualising themselves in a school context that straddles two contradictory social environments, the one represented by home and the other by the school. The objective of the study was to investigate how these learners adjusted to the new school context while, simultaneously remaining rooted in their home environment. An empirical investigation, by way of the quantitative research method was conducted. Following the quantitative approach as the methodological paradigm, a self- designed 4-point Likert scale questionnaires was used to gather information about the situatedness of township learners at historically white high schools in the Northern Cape. The finding of the study surprisingly indicated that while racial incidents occur at these schools, township learners had no difficulty in adapting and that their peers in townships from which they hail has not treated them any differently. The study did however reveal that township learners tend to be more withdrawn and their failure and drop-out rate tend to be much higher than their white peers.

Keywords: *Township, learners, situatedness, historically white schools, Northern Cape*

Introduction/Problem

Reference to the term "township" will be made throughout the paper. Harber, (2001); Leoschut, (2006); Prinsloo, (2007, 2005) describes the term township as follows: "Township residential areas in South Africa originated as racially segregated, low-cost housing developments, for black labourers to remain closer to their places of employment within the cities and towns. Today, township life is mostly associated with poverty, crime and violence and it has even been equated to a 'war zone', when the safety of residents becomes compromised".

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Erasmus and Ferreira (2002:28) state that the South African system has recently undergone a transition, creating a new responsiveness to alternative ways of thinking and behaving. The present educational dispensation advocates a multicultural policy, aiming for a non-racial and non-sexist education system. When local-traditional orientations meet global post-modern orientations, as is happening in South Africa education, interests can and do conflict. This may especially be the case if the infrastructure of the school concerned is inadequate or the teaching staff is under-prepared and under-qualified to handle this very demanding situation. The situation is not only demanding for historically white school teachers, but also places township learners attending these schools, in an invidious scholastic situation.

In this regard, Ntuli (1998:86 - 87) and Mncwabe (1993:193) and (Motal, Dieltiens, Carrim, Kgobe, Moyo and Rembe, 2007:4) and (Sunday Times, 2009: 6) highlights the following key points relating to the township learner's situatedness in historically white schools namely:

The fact that most historically white schools present a township learner with an educational environment which may not be attuned to their needs, but to those of the white learner, may demand a considerable amount of adjustments from the township learner. Before, a sense of inferiority and rejection has been created in the township learner, due to the admission policies of most historically white schools. Most of these schools have used one or more of the following selection mechanisms for black applicants: 1. parents must live in the area; 2. parents must own property in the area; 3. learners may only be admitted into Grade One, provided that they come from an English-speaking pre-primary school; or 4. Learners must not be older that the average of the grade to which they are being admitted.

All the above-mentioned issues, which might be portrayed as forms of prejudice, racism and discrimination may evoke a sense of frustration and hopelessness among many township learners. This may result in some township learners developing defiant and militant attitude. These issues were normally also met with a strong sense of rejection by township learners, as they only applied to township learners, but not to other nationalists such as Portuguese, Chinese, etc. Most township parents regarded these conditions as insurmountable obstacles that was instituted by people who had no understanding of conditions under which they live, for example the inconvenience of commuting from one residential area to another, (Motal, et al., 2007:4).

Historically white schools in the Northern Cape may also be affected by some of these issues. These issues of prejudice and rejection may play a contributing role with regards to the scholastic experience of black FET learners at multicultural schools. If the mentioned points are not adequately addressed by education authorities, it may lead to these learners not developing a positive self-concept. It may further also increase the perception of these schools being sites of hostility and rejection, held by some township learners. The perpetuation of this perception may in turn impede their adjustment at these schools.

Literature Review

Most township learners attending historically white schools in the Northern Cape may find themselves in a very awkward situation, as the norms learned at home and in their community may often be in conflict with those of peer group in the school. These two conflicting world may be confusing to the learner and result in a strenuous and unsatisfactory scholastic experience. In relation to this, Urbani (1994:67 - 69), Frederikse (1992:12), Cross (1992:207)

and (Ntuli 1998: 180 - 182) singled out the following aspect relating to the township learner's situatedness in multicultural schools, namely:

Township learners are normally admitted to historically white schools on the basis of certain demands which they are expected to fulfil. Most of these learners, who attend school in historically white suburbs and travel extensive distances on a daily basis, as many still reside in townships, (Sekete, Shilubane & Moila, 2001). Juggling between adapting to the new school environment and maintaining good relations with their peers in the township places a tremendous strain upon them, (Erasmus & Ferreira 2002:29). This strain may, as an example, find expression during times of political unrests when township learners experience inevitable pressure to participate in organised stay-aways. Many of these learners confronted with such situations, often attempt to manage the situation by only changing into their school uniforms when they arrive at school. They regarded it safe to commute in civilian attire. Exercising this precautionary measure on a daily basis could be rather time consuming and may often result in some township learners being habitually late or often absent from school.

Despite the demands imposed by these two divergent worlds, for many of these learners and their families attending a historically white schools are regarded as a sign of upward mobility in their society, (Fataar, 2007). These learners inevitably find themselves in a rather unenviable position, as they attempt to conform to the foreign cultural school context, while simultaneously trying to remain accepted amongst their peers in the township. The latter situation may lead to other unforeseen challenges such as depression amongst these learners. In this regard, Williams (2007) opines that lingering exposure to social rejection, as is the case with these learners, diminishes the individual's coping resilience.

There is an average of about 69% township learners attending historically white schools in the Northern Cape, (Northern Cape Department of Education, EMIS, 2008). It is often the case that during intervals these learners may prefer to speak Setswana, isi Xhosa or Afrikaans (if it is an English school) with each other and virtually sit exclusively together. In the classroom setup, they may also opt to sit together or near each other if it is allowed. It would seem as if these learners are comfortable in the presence and company of each other. The social development and communicative skills of these township learners may as a result be inadequately actualised.

Relating to the latter, research conducted by Machaisa (2004:67 - 68) at a historically white Afrikaans school, revealed that most township learners do not participate in sporting activities at school, as most of them, are mostly interested in either soccer or netball, but these are often not offered. Many learners are also discouraged to participate in other sports, such as swimming and hockey, because coaching as well as other sport related announcements, is mostly done in Afrikaans. As most township learners may only have a rudimentary understanding of Afrikaans, they consequently fail to respond appropriately and may appear to be incompetent. The research findings further indicate that teachers at historically white schools seem to be less accommodating of the language needs of township learner, especially as far as extra-curricula activities are concerned.

Another issue these learners need to contend with is the fear of being rejected by their peers in the township. In an attempt to be accepted by their peers in the townships, township learners at historically white schools tend to carefully control their behaviour and attitude

when they are back in the townships. For example, these learners may opt to refrain from speaking English or wearing their school uniforms when going about.

In spite of the behaviour and attitude modification strategies displayed by township learners, they continue to be perceived as different. This may be because of a prevailing perception, those black township learners who attend historically white schools in the historically white suburbs, has adopted a typical middle-class subculture. Values, such as liberalism, elitism, personal autonomy, selfishness or egoism and political tolerance seem to have now been espoused by these learners. Values, such individualism and competition, that may now be aspired to by this subculture group, may not necessary agree with the so-called black life-world. As this group returns to black residential areas, their school experiences in historically white schools do not always appeal to their peer group in townships. Their conflicting new lifestyle and values they may have opted to embrace consequently result in this group being alienated by their black peers in the township as well. Township learners may now internalise this alienation as being rejected by both the school and as well as the township community. To this extent Major and O'Brien (2005) argues that social humiliation adds to identity threat that has a noteworthy influence on self-worth, scholastic accomplishment and general well-being of learners.

In conclusion, the situatedness of township learners at historically white schools seem to place these learners in a position where they constantly have to adapt and modify their behaviour to suit the situation they may find themselves in. When they are at school, they may have to adapt their language and socialisation patterns to fit in. The opposite may hold true when they are back in the township among their peers. This exercise of constantly adapting to various settings may prove to be cumbersome and emotionally taxing for these learners. Tabane & Human-Vogel, (2010:2) aptly states that "Learners who feel part of a group and have a sense of belonging, are more likely to have a sense of connectedness with other group members"

Where their white counterparts may only have to focus on the normal school programme, these learners may have the added burden of constantly adapting to two different worlds. This, together with the other challenges may set the scene for unsatisfactory scholastic experiences for these learners.

Design/Procedure

Quantitative Research

An empirical investigation, by way of the quantitative research method was conducted. A quantitative approach involves the … "processes of collecting, analysing, interpreting, and writing the results of a study" (Creswell 2013: v). As the researchers pursued to collect data from a large population and analyse and interpret on the township learners' situatedness in historically white schools, a quantitative approach was appropriate. Specifically, the study followed a quantitative survey design. According to Creswell (2013) a survey design is used when one gathers facts about a society or its part about the quality of collaboration among its people or institutions (Rossi, Wright & Anderson 2013). Since the study established the township learners' situatedness in historically white schools, the survey design was suitable in providing the methodological route.

Questionnaire
Following the quantitative approach as the methodological paradigm, a self- designed 4-point Likert scale questionnaires was used to determine the township learners' situatedness in historically white schools of township learners in historically white schools of the Northern Cape.

Purposive sampling
The research site of this study was limited to twenty-seven (27) historically white high schools in the five education districts of the Northern Cape province, namely, Frances Baard (10 schools), ZF Mgcawu (6 schools), Pixley Ka Seme (4 schools), Namaqua (5 schools) and JT Gaetsewe education district (2 schools). The respondents were selected using a purposive sampling. The criteria for inclusion in the study was: Further Education and Training (FET) learners in the selected research sites; township learners in historically white schools. Using the criteria, a sample population of 1037 township learners was identified as the respondents. A total of 832 questionnaires were completed by learners.

Data analysis
Data were analysed using Factor Analysis. In order to assess the factorability of the data, the researcher used the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's test of sphericity, that states that for the difference to be statistically significant, the P-value must be < than 0.05. Basically this means that there is a 95% chance that the results are due to influence of an independent variable, or a combination of independent variables and not to chance (De Vos, Strydom, Fouché, Delport. 2005:245). The data attained from the questionnaires was incorporated with the data attained from the literature study, in order for the researcher to make summaries, draw conclusions and offer recommendations.

Ethical considerations
Permission to conduct the empirical study was obtained from the Northern Cape Education Department, School Principals and learners of these specific schools.

Findings/Analysis

Table 1: Summary of township learners' experiences at historically white high schools in the Northern Cape

	χ^2 Value	p-value	Strongly Agree	Agree	Disagree	Strongly Disagree
			%	%	%	%
1. I experienced no difficulty in adapting to my school.	1	0.486	41.8	40.3	13.5	4.4
2. Racial incidents often happen at our school.	1	0.583	20.1	36.7	28.1	15.1
3. In our school, all learners, irrespective of their cultural background are treated the same.	1	0.565	27.5	38.2	25.8	8.5

4. Township learners tend to be more withdrawn than white learners during group work and other class activities.	1	0.524	20.0	30.5	32.9	16.6
5. The failure and drop-out rate tend to be higher among non-white learners than white learners.	1	0.539	27.5	**36.1**	22.7	12.9
6. I am more comfortable to be taught by teachers belonging to my own culture	1	0.489	18.5	42.6	20.5	18.4
7. I sometimes experience conflict between what I am taught at school and what I am taught at home	1	0.475	18.6	42.5	23.3	15.6
8. My friends who are not attending historically white schools still accepts me as a friend and has not changed their attitude towards me	1	0.623	57.8	31.6	7.2	3.4
9. I find difficulty in going to school when there are strikes and stay-always in townships	1	0.567	13.5	20.6	37.4	28.5
10. I find living in a township has a direct effect on my academic performance, because of lack of facilities such as computer centres and libraries in these areas	1	0.443	22.8	24.0	27.5	25.7
11. If I could choose, I would prefer to attend a historically black school	1	0.518	18.0	16.5	29.1	36.4

Astonishingly most of the learners agreed that they experienced no struggle in adjusting at their school (41.8%) strongly agreed, 40.3% agreed, while 13.5% disagreed and 4.4% strongly disagreed. This is contradictory to the views held by (Cross and Mkwanazi-Twala,1998:28-30) that believe that township learners have trouble adjusting at these schools.

These findings enhance the opinion of Moletsane (1999:32) that claims that racial incidents are broadly spread at these schools and that the mandate for transformation in our schools is of utmost importance. The majority of learners agreed that racial incidents often happen at their school, 20.1 % strongly agreed 36.7% agreed 28.1 % disagreed and 15.1 % strongly disagreed. In an attempt for historically white schools to assist township learners to ease into their new school environment, the total school environment, including sporting and cultural activities, should be altered, so as to be more illustrative of the cultural diverse landscape of the South African society, (Lemmer, Meier, van Wyk, 2006:10).

Once more, incongruous to Bennett's (2007:23) finding that teachers often make snap judgements, based on their subjective perceptions about learners and consequently treat them

differently. There was a great number of learners who indicated that all learners in their school, regardless of their cultural background, are treated the same. At least 20.1% strongly agreed, 36.7% agreed, 28.1% disagreed and 15.1% strongly disagreed. This is undeniably reassuring and may augur well in assisting township learners to adjust and feel accepted at these schools.

Learners response and the literature is in agreement that, township learners tend to be more withdrawn than white learners during group work and other class activities, 20.0% strongly agreed, 30.5% agreed, while 32.9% disagreed only 16.6% strongly disagreed. This tendency intensely shows that historically white schools dealt with integration in a way, that has been characterised by unevenness, in which white people are the holders of favoured knowledge and blacks, by contrast, as the personification of sub-standard understanding of the world (McKinney 2010:192). It is not startling that these learners seem withdrawn and lack confidence. This state of affairs is barely favourable for these learners to feel acknowledged and secure in the school context.

A rather perturbing finding is the high failure and drop-out rate amongst these learners (36.1%). These findings are highlighted in the literature, by Billings (2008:5) and (Ormrod, 2008:70) who argues that by abiding by to an insufficiency standpoint, white educators undermine the exclusive viewpoints, skills, and proficiencies of their learners.

An overpowering majority of learners specified that they are more comfortable to be taught by teachers fitting to their own culture, 18.5% strongly agreed 42.6% agreed 20.5%, disagreed and 18.4% strongly disagreed. The finding that an overpowering percentage of township learners experienced tension between what they are taught at school and home, respectively, seemed to be a major issue with, 18.6% strongly agreeing, 42.5% agreeing, 23.3%, disagreed and 15.6% strongly disagreed. These findings are resonating with the thoughts of (Erasmus and Ferreira: 2002: 30). The authors reason that children cannot be treated as learners in the normal sense without considering their direct upbringing and family history as well as the effect of these influences on their response to the learning environment. To safeguard that township learners' true individualities are not denied and that they are not and do not feel discriminated against at school. These schools should use an all-inclusive technique to teaching and learning to gain a healthier understanding of the life-world(s) of township learners.

While the literature advocates that acceptance by friends in the township, who are not attending historically white schools to be a problem, the results parades the contrary. A startling 57.8% strongly agreed, 31.6% agreed 7.2%, disagreed and only a mere 3.4% strongly disagreed with the statement. Notwithstanding being problematised by the literature, a large percentage of the learners indicated that they found no difficulty in going to school when there are strikes and stay-aways in townships. Only13.5 % strongly agreed, 20.6% agreed, 37.4%, disagreed and 28.5% strongly disagreed with the statement. The majority indicated that living in a township has no direct effect on their academic performance, because of lack of facilities, 22.8% strongly agreed, 24.0% agreed, 27.5%, disagreed and 25.7% strongly disagreed with the statement.
The results on the questions about living in the township clashes with that of the literature, where Ntuli, (1998:9) and (McKinney 2010:193) display these matters as a challenge and consequently hindering the academic advancement of these learners. The research proved the different, namely that these learners are still accepted by their township school- attending

peers; that travelling to school during strikes was not a problem and that the absence or lack of academic resources in townships did not hamper their academic progress.

The outcomes of the study nullify the argument offered by Erasmus and Ferreira: (2002:31) that suggest that, when given a choice of schools, township learners would select a school where all race groups are equally represented. The findings propose that the majority of township learners at historical white schools would not prefer to attend historically black schools 18.0% strongly agreed, 16.5%, agreed 29.1%, disagreed and 36.4% strongly disagreed.

Recommendation

The following aspects of the research, regarding the situatedness of township learners' at historically white schools are recommended for further investigation:

Historically white schools should genuinely attempt to know their learners and the township in which they live. This can be done by doing house visitations and engage in conversation with parents in their (parents') social space. In this way teachers may get a real sense of the home environment of these learners, as opposed to perceptions formed from media reports and other sources.

Historically white schools should transform in such a manner that the values, traditions, culture and ethos of the black learners too, are reflected in them. Furthermore, it is importance that the proficiency of township parents on matters of culture, tradition and sport be employed.

Schools should attempt to make connections with what learners are taught at school and what they are being taught at home. In so doing the formation of real communication and information-disseminating mechanisms between the school and home environment may assist in neutralizing this rift.

More should be done to limit the high failure and drop-out rate amongst township learners at these schools. Many of them, who fail or drop-out of school, may in fact have the intellectual capability to complete their school careers.

Conclusion

The objective of the study was to investigate the situatedness of township learners attending historically white schools in the Northern Cape. The finding of the study indicated that while racial incidents occur at these schools, township learners had no difficulty in adapting and that their peers in townships from which they hail has not treated them any differently. This is contrary to the findings of the literature that indicates that township learners experience great challenges in adapting to these schools. Findings from the literature and empirical investigation did however reveal that township learners tend to be more withdrawn and their failure and drop-out rate tend to be much higher than their white peers.

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The Effect of Peer Tutoring Program to Enhance Social Skills of Higher Education Students with Autism spectrum:

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Abstract

The purpose of this research was to study the effect of peer tutors program on the ability of peer tutor in helping students with autism spectrum to enhance the social skills of students with autism spectrum and study the effect of the peer tutors program on social skills of students with autism spectrum. The research methodology is based on action research to develop peer tutors program. The data collected in this research consisted of instruments 1) The instruments used in the operating include peer tutor volunteer survey and the peer tutor guide was rated as very good level. 2) The instruments used to reflect the operating results include behavior observation form of peer tutor and follow-up interview using the peer tutor guide. 3) The instruments used to evaluate performance is quality assessment form of peer tutor guide. Quantitative and qualitative data analysis with mean percentages and standard deviation and descriptive lectures.

The research results were as follows

1) The results of the peer tutors program were peer tutor can assist students with autism spectrum is rated as very good level.

2) The results of the peer tutors program to social skill of Students with Autism spectrum were can enhance the social skills of students with autism spectrum is rated as good level.

Keywords: Peer Tutors Program, Peer Tutors, Higher Education Students with Autism.

Higher education offers opportunities for people with disabilities to develop to their individual potential and subject to the limitations of disability. Students with autism spectrum disorders are another type of disability that enters higher education in higher education. Limitations on social relationships with friends of the same age. Causing difficulty in relationships with others, social interaction impairments. It will be expressed in a manner of lack of understanding social implications. Lack of response to the feelings of others and appropriate behavioural control based on social status. In particular, inappropriate interactions with social or temporal contexts. Including impaired interpretive and academic skills. Expressed in the form of lack of language skills. It also affects the perceptions of learning within and outside the classroom. Cannot understand and access needs. Participation in teaching activities is limited.

In this study, the researcher conducted a Peer Tutoring Program to enhance the social skills of students with autism spectrum. Creating initial understanding for friends is a driving force that will guide students with autism spectrum support and be ready to develop their own potential. By helping each other Which is used in everyday life as a way of life. And to support the teaching and learning support. Companions are important to push. Encourage students with autism spectrum to draw strength and develop their own abilities. Independent living and inclusive education in higher education has full potential. The research area is

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Disability Support Services: DSS include three students with autism spectrum and five peer tutors studying in Khon Kaen University.

Major characteristics of students with Autism Spectrum Autism or Autism Spectrum. It is a disorder of the brain that occurs in childhood. And repeated behaviour or repetitive attention Limitations on any one topic, which are characteristic of individuals with autism Spectrum. It shows abnormal symptoms in 3 major aspects:

1) Social disorders and interactions with others.

It will be expressed in a manner of lack of understanding social implications. Lack of response to the feelings of others and / or appropriate behavioural control lists based on social status. Use impaired social symbols. And a combination of social, emotional, and nonconforming social behaviour. In particular, inappropriate interactions with social or temporal contexts.

2) language and communication disorders

Expression in the form of lack of language skills, social use, impaired play and fictional play, but appropriate interaction for conversation, the flexibility of language expression is relatively low. Creative and imaginative models lack emotional response to the speech or physical language that others express, have impaired waits for communication, and often use gestures. The operators that do not comply with the language.

3) Emotional and behavioural disorders.

It has been found that behavioural patterns, interests, and behaviours tend to be repetitive, unlikely to be flexible, limited in scope, limited to what you used to be, regardless of activity or activity. In a new way, it still shows in the same way. Especially in very young children adhering to the texture or attention to the specific characteristics of certain objects, such as catching milk or touching that object, and standing to treat what you once did. This is unchanging, even if it is not appropriate, it may look like something very wrong.

Social problems (social problems) found in students with autism spectral spectrum are divided into 3 types.

1. Socially awkward expressions try to have friends, but they cannot maintain that relationship because both parties lack interaction.

2. Avoid socially avoidant Avoid all interactions with others, including anger, anger, anger, anger, running away.

3. Ignore socially indifferent, not interested in interacting with others and not aware of what they are.

Practical approach for students with autism spectrum.

Those who work with students with autism spectrum disorders need to have a better understanding of the characteristics and conditions, and gradually learn the behaviour and emotions of each person in detail, and begin helping to build rapport and influence. Get out of the personal world before.

1. Must know students with autism spectrum in terms of behaviour and emotions are specific individuals.

2. Must have patience, effort, determination, commitment to help students in this group seriously and sincerely.

3. Must understand the mind and be able to read minds or read minds of students with autism spectrum. This group is derived from behaviour or from emotional expression. When creating relationships and persuading them to come out of the private world, they can continue to train these individuals as individuals.

4. In the study of higher education lessons. Higher levels of understanding are needed at the secondary level. Students with autism spectrum disorders may exhibit anxiety, and behaviours may be varied, as some may say. Some may say less or do not say it the instructor

must observe and observe behaviour, advice and assistance closely.

5. Provide students with autism spectrum. Know beforehand to do activities. Especially the activity changed from the original activity. Because of the nature of students with autism, the spectrum is anxiety and may feel confusing when it comes to changing routine. To prevent problems can be clarified. Tell students with autism spectrum awareness ahead of new activities. Or before new events take place.

6. Prepare social skills. To students with autism, spectrum, social skills, and cultural traditions, such as facial expressions, tears, grief, tears, crying at funerals, laughs, happy smiles when participating in fun festivals, happy students with autism. The spectrum is emotionally impaired, and the person closest to it must inform and train.

7. Help with words or abstract language. Students with autism spectrum will learn and understand straightforward, straightforward language. Words that are proverbs, aphorisms, and abstract expressions are difficult to understand, do not understand, and may misunderstand.

8. Training to assist students with autism Spectrum Disorder Spectrum Disorder in Activity or Time to Appointment It is known that students with autism spectrum are usually punctual and strictly adhered to. Often expressing aggressive emotions or unwanted behaviour because it is not flexible.

The educational process must encourage students to develop naturally. And full potential by organizing content and activities in accordance with the interests and aptitudes of students. Take into account the differences between individuals. Practice thinking skills, managing coping situations. And the application of knowledge to protect. Solve problems and learn from real experiences. (National Education Act, 1999). To develop learners both physically, mentally, intellectually, emotionally and socially. To enhance the attitudes of life values, in still moral values and desirable values. Encourage students to know and understand themselves. Adapt and socialize. Nation and live happily. Design to develop learning the change is varied. The whole process of direct experience leads to a learning process that is a skill that transforms learning behaviour. Development through activities or programs is a process that enhances and enhances the skills of individuals with autism. From the development of the program, the partners of The Metropolitan Nashville (Carolyn Hughes, Carol Guth, Judy Presley, Marilye Dye, and Corie Byers) have developed 7 Steps. Step 1: Step 3: Select and match pairs Step 4 Teach your partner's learning strategies Step 5 Provide feedback and evaluation Step 6 Promote interaction between students and peers Step 7 Establish an advisory board Therefore, the development of the program for companion. To strengthen the social skills of students with autism. Step 1 Take Peer Tutors, Step 2 Develop Peer Tutors, Step 3 Peer Tutors, Step 4 Follow Peer Tutors and Step 5 Peer Tutors as appropriate, based on the theme and context of the educational management of the area. Research Operations

It leads to the development of Peer Tutors Program. It means the process of understanding the basics. A guideline for helping fellow students with autism spectrum impairment and reducing barriers to teaching and learning in higher education. It consists of 5 steps as follows:

Step 1: Apply for Peer Tutors
Step 2 Develop Peer Tutors Guide
Step 3 Peer Tutors Preparation
Step 4 Practice and Follow-up Peer Tutors
Step 5 A Guide for Higher Education Companions

The purpose of this research

1) Study the effect of peer tutoring program on the ability of peer tutor in helping students with autism spectrum to enhance the social skills of students with autism spectrum

2) Study the effect of the peer tutoring program on social skills of students with autism spectrum.

Target groups are peer tutors and students with autism spectrum. Currently studying at Khon Kaen University, eight students are selected by purposive sampling. Consider the following criteria.

1) Student with autism spectrum diagnosed and certified by a doctor. Studying at the undergraduate level. Under the supervision of Disability Support Services (DSS), Khon Kaen University. According to the following disciplines:

- Social Development Faculty of Humanities and Social Sciences (1 student)
- Business English Faculty of Humanities and Social Sciences (1 student)
- Music and Performing Arts Faculty of Fine Arts (1 student)

2) Five of students studying at university level Khon Kaen with interests and volunteers join. Currently studying in a panel of students with autism spectrum disorders, and is approached by a specific selection. Based on the following criteria.

- voluntary participation
- volunteer to help those who have special needs.

Benefits

1) Have a peer tutors guide and those related to students with autism spectrum in developing social skills for students with autism spectrum disorders in higher education.

2) Program and guidebook for peer tutors and those involved with students with autism. Spectrum for developing social skills for students with autism spectrum disorders in higher education.

3) Promote social interaction and good attitudes among peers and students with autism spectrum.

Peer Tutors Program

A set of guidelines for helping students with autism to stay alive and reducing the barriers to teaching and learning in higher education consists of the following 5 steps:

Step 1: Apply for Peer Tutors

Exhibiting a fellow student volunteer to join a companion program from public relations to post or volunteer activities. Department of Student Affairs or Student Services Center (DSS), Khon Kaen University

Step 2 Develop Peer Tutors

Develop a companion guide for higher education

Step 3 Peer Tutors

Preparedness Cognitive Development and Help Techniques How to Use the Social Skills Development Guide for Students with Autism Spectrum Training is held for one day, divided into group learning activities as follows.

- Getting Started with a disabled friend (Dissolving behaviors to initiate and understand disabilities of disabled people)
- Autism Spectrum Activity Near Us (Create knowledge Understanding students. Students with autism spectrum)
- Helping Activities Autonomy Spectrum with Social Skills for Students with Autism Spectrum Disorders in Higher Education
- Introduction to the Guide to Helping Students with Autism Spectrum of Social Skills for Students with Autism Spectrum

Step 4 Follow up Peer Tutors

Into the field after the preparation leads to the actual practice. According to the model or guidelines, the help manual in different situations according to skill is a time of companion help. Promotion of teaching Solving Problems and Obstacles of Students with Autism Spectrum Both inside and outside the classroom Track the results and reflections during

implementation and rescue approaches when obstacles and problems arise. After the practical implementation between peers and students with autism spectrum

Step 5 Prototype Peer Tutors

Conclusions on the Development of a Peer Supporting Partner Program for Social Skills Promotion Students with Autism Spectrum

Data collection

To study the results of the program for companions. To enhance the social skills of students with autism spectrum. The data will be collected as follows:

1) Take a volunteer survey. Ask for cooperation with friends. Of students with autism spectrum Volunteer survey contain with the ability of music partners to sing in foreign languages. And computer. Along with the information included in the class, students with autism spectrum Conversation with Students with Autism Spectrum Disorder And attitudes toward students with autism spectrum

2) Developing a guide for companion partners in higher education. By observing the behavior of students with autism spectrum in schools. And interviews with fellow students and students with autism spectrum research related research theories. Essay articles for compiling information, developing companion manual in higher education.

3) Implement a companion program. To enhance the social skills of students with autism spectrum. Record of observation, companion behavior, and student behavioral observation with autism spectrum. Along with assessing the ability of friends.

4) Take a follow-up interview for information from your partner After implementing the program for companion partners in Round 1 and Round 2, to analyze the results leading to improvement. Promote the social skills of students with autism spectrum.

Discussions

In research, study the effects of using a companion program. To enhance the social skills of students with autism spectrum. The purpose is to study the results of the program for companion friends. To strengthen the social skills of students with spectral spectrum autism on the ability of peers to assist students with autism Spectrum. To enhance the social skills of students with autism spectrum. And to study the results of the program for companion friends. To enhance the social skills of students with autism spectrum to social skills of students with autism spectrum. Researchers can discuss the following results.

1) The results of the program for companion friends. To strengthen the social skills of students with autism spectrum to their partner's ability to assist students with autism spectrum. To enhance the social skills of students with autism spectrum. Development of companion program the five steps illustrate the development of peers in each aspect. Especially regarding the value of joining the program. Encourage people to understand people with autism spectrum. And know the right way to communicate. Which is knowledgeable Companion Ability for Students with Autism Spectrum Disorder The results of the assessment of competence are at the highest level, which can be expected to achieve the intended purpose.

2) The results of the application program for companion friends. To enhance the social skills of students with autism spectrum to social skills of students with autism spectrum. Effects of social skills development of students with autism spectrum. Has been developed individually Which results in the use of polite words. Suitable for the context of the location. Choosing the right tone is not aggressive or harsh. Appropriate interventions / arguments and accept the comments of others as a result of the fact that a friend has helped, he has developed his intended purpose. The social skills assessment of students with autism spectrum was at a high level.

Research result

From the development model, companion with a partner program to enhance the social skills of students with autism spectrum. It was found that the performance of the companion before the operation was 3.65 on a very high level. The effect of the first round was 4.18 on the high level and the effect on the second round was 4.68 on the highest level. The average scores for all three sessions can show the level of companion development. The purpose of the research.

Reflection of Round 1 Process of Performance Evaluation of Companion Behavior As a result of the first round of implementation, the overall average of 3.96 is very high, leading to an analysis and development plan for the next round.

Reflection of Round 2 Processes from Assessment of Peer Behavioral Observation The overall average of 4.49 is very high. From this mean it can be stated that the development of the second round, which has been improved, improved the first-round approach. The second round has an average score that reflects the behavior of the companion buddies who develop the change in the right direction.

Enhancing the social skills of students with autism spectrum. From the social skills assessment of students with autism spectrum Prior to operation, the mean of 3.50 was moderate, the effect of round 1 was 3.69 on average and the effect of round 2 on average was 4.25. The social skills of students with autism spectrum have been developed to achieve the objectives.

Suggestions

The results of this research. Researchers have research recommendations that will be of benefit to those who study or are interested.

1) Development of peer-to-peer development program. Can be adapted and adapted according to the context of each institution.

2) Questions for Students with Autism Spectrum Can use questions that raise concrete understanding.

Suggestions for next research

Studying the context of a research facility is another important part of the data availability and continuity. Because there is a risk of error in the target audience. This is the part that affects the development of the program.

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English as a Corporate Language: Power Dynamics in Multinational Workplace in Thailand

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Abstract
Since English has been promoted as international language, some multinational workplaces regulated English as corporate language. Previous studies found that this can cause power inequality among members within organization. To extend this line of research, the aim of this study was to explore the effects of regulating English as a corporate language on power dynamics in multinational workplace in Thailand. 10 members of Faculty of Liberal Arts were interviewed and observed during the faculty meeting. The finding revealed that English as a corporate language is debatable issue. In actual situation, language for organizational communication depends on the majority of the member within organization. Consequently, this will cause language barriers for minority in order to interact with other Thai members.

Keywords: *corporate language, English language, multinational workplace, power dynamic*

1. Introduction

Since globalization has been introduced, there has been a huge flow between the line especially language and culture. People started to communicate each other globally. Speakers of English are more likely to be using their language with other multilingual speakers than with monolingual speakers. With increased human transportation around the world, language and culture also plunge into diversification (Kubota, 2001). English, then, has been perceived as an international language which can be explained that

> "An international language is not the possession of a specific group. It is public property. it is not the vehicle of a single culture. it becomes the vehicle of any culture to which a user applies it."
>
> (Bryan, 1994)

This can be said that English no longer belongs to 'native speakers'; it is used by other people in bilingual/multilingual situations with various forms of pronunciation, vocabulary, syntax and discourse (Kubota, 2001) and both listener and speaker, in human interaction, should share responsibilities so that communication takes place. English, then, becomes a common medium in multilingual space.

Since English has been regulated widely as a common corporate language for multinational workplaces, they have seemed to face this challenge in communication among people with their different background such as language, nationality and culture. The employees speaking different mother tongues have to overcome language barrier in order to keep their communication and relationship with colleagues moving on. Eventually, they create significant

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consequences for their workplaces. Among many other effects, Tenzer and Pudelko (2017) suggest that language differences can contribute to power dynamics in workplace. Such a power can be extended as "power-authority distortions" (Harzing & Pudelko, 2013) in which language proficiency-based advantages can modify the power structures mandated by corporate hierarchies (Harzing & Freely, 2008; Yamao & Sekiguchi, 2015). To extend this notion in Thai context, this study aims to explore the effects of regulating English as a corporate language on power dynamics in multinational workplace in Thailand.

2. Literature Review

The impact of language differences on power dynamics in multinational workplace

Researchers on language in international business have revealed that language differences influence power dynamics in multinational workplace (Marschan et al., 1997; Charle & Marschan-Piekkari, 2002). They observed that many employees prefer to communicate with colleague sharing their native tongue rather than foreign ones. In addition to this, they found that employees can enhance their power if they are proficient in the official corporate language, the multinational company's home country language and/or the language used by senior management (Piekkari et al., 2005; Welch & Welch, 2008). To elaborate, proficiency in relevant language offers employees privileged access to information and more interaction within the workplace.

Since many multinational workplaces have selected English as their official corporate language, native English speakers are likely to achieve language-based positions of power (Neeley, 2013; Peltokorpi & Vaara, 2012). On the other hand, employees who have low proficiency in the official corporate language are limited in their conversation abilities and may be excluded from critical exchanges of information (Fredriksson et al., 2006). They are less involved in decision-making and experience a loss of power within organization (Luo & Shenkar, 2006). Supported this debate, Neeley (2013) investigated language-based changes and employees' perceived status. The studies revealed that non-native English speaking employees experienced a status loss when their organizations regulate English as a corporate language; whereas, this elevates the status of native English speaking employees in the organization. From this findings, it can be concluded that highly fluent speaker usually evaluated more highly, are more influential in different situations, and more likely to achieve group dominance.

Such distortions in status or power balance can generate stress, distrust, frustration and resentment among individuals with lower proficiency level in corporate language (Harzing & Puldelko, 2013; Neeley, 2013). For this reason, language-based power can cause conflicts and disputes and disrupt cohesion, collaboration, and performance within multinational workplace.

Research questions

1. What are the employees' perceptions towards regulating English as a corporate language?
2. What are the effects of regulating English as a corporate language on power dynamics in multinational workplace?

3. Methodology

3.1 Research setting and participants

The aim of this study was to explore the possibility of regulating English as a corporate language in a multinational workplace. With this condition, I chose a faculty of Liberal Arts at a large-sized university where houses various nationalities of employees with different languages of speaking. The faculty comprises of department of English, Japanese and Social

Science and Humanities. The participants were 10 employees working in the faculty. The instructors were randomly selected except foreign instructors who are all included. They are Canadian, American and Japanese.

3.2 Data collection

To explore employees' perception towards corporate language policy, it is crucial to sample participants with different proficiency levels in English. In order to triangulate how employees with varying perceptions towards English as a corporate language, I interviewed not only members, but faculty executives to perceive variety of perspective from different hierarchical levels. This allows researcher to obtain profound understanding such as language policies showing that which degree these policies were influenced by faculty member management. Interview and observation were used as methods of data collection.

4. Findings

To answer the research question, I will focus on how individuals perceived towards English as an official corporate language. The findings will be presented through an illustrative case description dividing into two sources: from interview and from observation.

4.1 Should English be regulated as a corporate language?

From the interview, the overview of the data can be divided into two sides. First, employees who support this practice and give the ideas that:

> *"not only Thais here, so we should have a medium language that everyone can speak. And I think English should be the good one. Actually, I don't expect the perfect grammar, just communication. If they speak Thai, I get nothing"* (foreign employee 1)

> *"I cannot speak English very well, I understand a bit. But in my opinion English is better than Thai because there are other Farang teachers. If you speak English, all of us can understand what you say."* (foreign employee 2)

> *"Actually, as our faculty offers language instructions and we have not only Thai members, but foreign ones; therefore, English should be a better one. However, it is difficult to announce English as corporate language because most of us are Thai, and some cannot fully understand English. This sometimes can cause some misunderstandings especially in important decision making."* (executive 1)

As three responses above, they perceive English as essential language in multilingual workplace. However, there are some employees disagree with this by expressing their ideas as following:

> *"The majority is Thai and most of the time we, all Thai staff, have to arrange the important meeting in which we have to discuss and make a decision on the important issues. The use of English will be an obstacle. If you want to communicate with foreign employees, you can talk to them in person or provide interpreter. But I think the later one will prolong the meeting time."* (Thai employee 1)

> *"I understand what other foreign members feel when they don't understand what we are talking about. But I insist that Thai is the best language for communication within*

workplace. For foreign employees, English instructors should assist them and act as moderators among the faculty members." (Thai employee 2)

"I just think that they should start to learn Thai language." (Thai employee 3)

4.2 Language differences and power dynamics

Apart from interview, I posit myself as active observer in the faculty meeting where every Thai and foreign members have to attend. I found that Thai language was employed as language of meeting. Everyone spoke Thai even the leaders. The attendees are divided into several groups Japanese members sat with Thai instructors teaching Japanese and Portuguese and American members sat with Thai instructors teaching English. During the meeting, the foreign members didn't participate in communication at all. The meeting leader asked participants to give an idea and make a decision on the issue about working load. Everyone did except foreign members until they turned to me and asked "what did she ask to do?". Japanese members tried to ask their peers for interpretation, but they didn't get any answer because their peers were focusing on what the leader said. Finally, they seemed to ignore the meeting, play their mobile phones and walked out and walked in more and more. Surprisingly, at the end of the meeting, the leader asked the foreign member that "Do you understand what we have discussed?" they replied "yes" and the leader responded "if you don't understand or have something to ask, please contact me or other members".

5. Discussion and conclusion

Even though English is widely accepted as international language, it is not promoted exclusively as corporate language. It is still a controversial issue. Unsurprisingly, the foreign employees support this policy; on the other hand, Thai members are not satisfied to have English as a corporate language. One thing to be noticed is that the executive agrees to regulate this policy but he or she cannot take this action officially because the majority language is Thai and most employees are Thai. This can be said that the possibility to establish English as a corporate in multinational workplace in Thailand rarely happens especially when most of employees are Thai native speakers.

From observing during faculty meeting, obviously, language and power are intertwined. Employees who cannot speak language meeting didn't participate in any activity in the faculty meeting. They have no authority to express their ideas or comments and to make a decision. This shows that power fall into employees who are proficient in the official corporate language, the multinational company's home country language and/or the language used by senior management (Piekkari et al., 2005; Welch & Welch, 2008). Conversely, stress, distrust, frustration and resentment are generated for individuals with lower proficiency level in corporate language (Harzing & Puldelko, 2013; Neeley, 2013). Therefore, power implications should be considered when defining a corporate language. Finally, we can say that "a language lens can expose asymmetrical power relations in organization" (Itani et al, 2015, p.376).

6. Limitations and recommendations for future research

This study explored only in multinational workplace where language mostly used is home country language and most employees are native speaker of corporate language. Because of this, the future research should investigate in the organization where most employees are not speaker of the country organization located.

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Learners' Perceptions of their Teachers' Application of Integrated Science Process Skills in the Teaching of Geography in Secondary Schools in the Free State Province, South Africa

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Abstract

The purpose of this research was to examine learners' perceptions of their teachers' application of integrated science process skills in the teaching of geography in secondary schools in the Free State Province, South Africa. Based on the literature review, a questionnaire on the application of integrated science process skills in the geography classroom was developed. A quantitative approach was adopted because it provided learners with an opportunity to rate the frequency at which teachers applied different integrated science process skills in the classroom. The objective was to establish learners' perceptions of their teachers' application of integrated science process skills in the teaching of geography. Systematic sampling was used to select the sample. Every 22nd school was selected until a sample of fourteen schools was reached. Fifty questionnaires were sent to each selected school with an instruction to the school principal that ten questionnaires be given to the learners of each grade. Of 700 questionnaires mailed, 355 were returned which represented a return of 51 percent. A literature survey revealed that some researchers were of the opinion that integrated science process skills were suitable to and effective in the teaching of geography at secondary school level. Literature also indicated that integrated science process skills were linked to the objectives of geography and could be realized and achieved as observable and demonstrable objectives. Empirical research showed that learners were of the opinion that their teachers applied integrated science process skills to the teaching of geography. The results also showed that, according to the learners' perceptions, tasks in which teachers encouraged learners to identify variables that affected geographical phenomena were given most of the time. Exercises in which teachers gave learners hypotheses and requested them to design investigations to test the given hypotheses were applied less often.

Keywords: *Geography learning, geography teaching, integrated science process skills, learners' perceptions, science process skills.*

Introduction

The nature of geography in education has changed from a subject which described and interpreted cultural phenomena of the world (Rambuda 1994) to a subject that requires learners to be able to practise the following specific skills:

- Identifying questions and issues;
- Collecting and structuring information;
- Processing, interpreting and evaluating data;
- Making decisions and judgements;

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- Deciding on a point of view;
- Suggesting solutions to problems; and
- Working co-operatively and independently (Department of Basic Education 2011).

It is possible for geography teachers to develop these specific skills in classrooms where there is inquiry learning, which is a foundation for science process skills development. The current secondary school geography curriculum in South Africa aims to foster critical thinking in learners. Critical thinking is also synonymous with science process skills; hence most of the specific skills mentioned above cannot be performed without the knowledge of science process skills. Geography teachers need to emphasize science process skills in their lessons (Rambuda 2002). Science process skills are the instruments through which inquiry learning could be conducted (Wilke and Straits 2005). Moreover, Rambuda (2002) has encouraged teachers to conduct experiments when teaching physical geography. There are two categories of science process skills, namely, basic science process skills and integrated science process skills (Padalia 1990). Integrated science process skills rely on learners' capabilities to think at a higher level and consider more than one thought or aspect at a time (Martin Sexton, Wagner and Gerlovich 1994). These skills are more complex than basic skills. Integrated science process skills are taught to learners who have mastered basic process skills (Esler and Esler 2001). Just as in basic science process skills, so integrated science process skills are used in problem solving. They are the immediate tools which could be used when seeking solutions to problems (Funk, Fiel, Okey, Jaus and Sprague 1979). This paper deals only with the application of integrated science process skills because these skills are used as a unit in experimenting. The skills that teachers should apply to the teaching of geography are defining variables operationally, hypothesizing, manipulating and controlling of variables, interpreting data and experimenting. Other science process skills such as constructing a table of data, plotting a graph, acquiring and processing data, designing investigations and analysing investigations are developed when the skills mentioned above are developed and promoted in geography lessons.

Literature Review

The following integrated science process skills could be applied in geography classrooms:

Identifying variables

A variable is a concept or characteristic that has several values (Leedy and Ormrod 2013; McMillan 2012). Feng and Debben (2013) define geographical variables as variables that offer evidence about the features of a place, instead of just the position of that place. For instance, the amount of rainfall was 20mm and 23mm in June and July respectively. This example shows that a variable is any phenomena that can fluctuate or change. The skill of identifying variables is important when one is conducting an investigation. For a person to be able to plan and carry out an investigation, they have to identify the variables as independent (manipulated) or dependent (responding) and as categorical or quantitative. A quantitative variable assigns number to different geographical phenomena. For example, today's temperature is 13^{o}C whilst yesterday's rainfall was 23mm. Categorical variables are qualitative in nature. They change in degree, amount or quantity (Fraenkel and Wallen 2010). For instance, dark grey clay soil, light brown loam soil and red brown sand soil are categorical variables. Identification and manipulation of variables is a skill that can be applied to the geography curriculum. Learners who can identify variables should also be able to construct a table which shows the data for the relevant variables.

Constructing a table of data
The variables' information concerning phenomena can be represented in tables. One is able to establish trends and patterns by analysing the tables (Rezba, Sprague, Fiel, Funk, Okey and Jaus 1995) which could be the measurements of temperature, rainfall, time and volume. What is important when constructing a table of data, is that the person should record the independent variable on the first row and the dependent variable on the second row. If manipulated variables are listed in order of magnitude, one is able to establish their pattern of change. This is also applicable to the responding variable. When given a written description of the measurements made during an investigation, learners should be able to plot a table of data. They should be able to write pairs from a table of data and ultimately match data pairs with points on a graph. The skill of organizing data in a table can promote the skill of plotting a graph.

Plotting a graph
Geography learners are able to construct a graph when provided with a description of an investigation and a table of data. The best way to present data that is in a table is to plot a graph to get a picture of what the data looks like. Learners should be able to read graphs in order to comprehend and accord meaning to what is happening around them. Liebenberg (1986), as cited by Rambuda (2002), argues that graphs show concealed qualities of the data and make the message simple to comprehend. This is possible if learners could describe relationships between variables.

Describing relationships between variables
A constructed graph is a coded message which learners should be able to interpret and explain. Therefore, it is important for learners to explain the trends and forms shown by graphs. The description should provide a synopsis of the relationship between the independent variable and the dependent variable (Durrheim 2002). When processing data, investigators describe the relationship between variables, as this may enable them to acquire different kinds of information on the subjects of their research (Fraenkel and Wallen 2010). The presentations of graphs should not distort the relationship between variables (McMillan 2012).

Acquiring and processing data
Researchers observe, collect and analyse data, and draw conclusions to solve problems (Martin, Sexton, Wagner and Gerlovich 1994). Geographers observe different elements of weather every day. They should be able to construct tables of data using the measuring units of these elements.

Analysing investigations
Rezba, Sprague, Fiel and Funk (1995) maintain that analysing investigations comprises recognizing the parts of a usual investigation. It encompasses identification of the independent, dependent and constant variables. It also includes identification of the hypothesis being tested when provided with an explanation of an investigation.

Constructing hypotheses
Hypothesizing is the process of making an 'imaginative leap' beyond the data to try to account for observed features (Millar 1989). A hypothesis is subject to empirical testing,

validation and possible rejection (Gay, Mills and Airasian 2011; Leedy and Ormord 2013). It is a supposition stated in the form of a probable solution (McMillan and Schumacher 2010). Consequently, a hypothesis is a tentative explanation or theorem of what scientists think the outcome of their research will be (Van Aswegen, Fraser, Nortje, Slabbert and Kaske 1993). Investigators who formulate hypotheses use their background knowledge, experience and information from other investigations.

Defining variables operationally

An operational definition is the description of how scientists delineate and measure the variables in their studies (Cresswell 2012). An operational definition gives connotation to a variable by stipulating the events or processes required to quantify, classify or manipulate that variable (McMillan 2012; McMillan and Schumacher 2010). An operational variable conveys to the investigator what is crucial to solve the problem or test the hypothesis (McMillan and Schumacher 2010). In some circumstances, an explicit, functional definition proper for discovering a measure is not at one's disposal, and one needs to create one's own definition (Cresswell 2012). It is critical to comprehend operational definitions because investigators will use diverse methods of measuring or manipulating the same variable. The substance of the results rests on comprehending the operational definition (McMillan 2012). If the researchers have constructed their own definition, they should test it on people conversant on the subject and the variable before they employ it in their investigation (Cresswell 2012). Operational definitions are valuable mechanisms and should be learnt by all geography learners.

Designing investigations

Rambuda and Fraser (2004) maintain that once hypotheses have been constructed, the investigator should devise an investigation to test them. The devised investigation should be lucid in order to enable the investigator to gather functional data. The gathered information should be lucid in order either to confirm or reject the developed hypothesis.

Experimenting

Experimenting is an operation that combines basic and integrated process skills. Learners who are given opportunities to experiment learn to state problems, test hypotheses through manipulation and control of variables, and interpret and present results in the form of reports (Van Aswegen *et al.* 1993). Experimenting entails formulating a question, a hypothesis, finding and controlling variables, using operational definitions, conducting the experiments and interpreting data ((Martin, Sexton, Wagner and Gerlovich 1994).

Research Procedure

A quantitative approach was adopted because it provided learners with an opportunity to rate the frequency at which teachers applied different integrated science process skills in the classroom. The objective was to establish learners' perceptions of their teachers' application of integrated science process skills in the teaching of geography. Systematic sampling was used to select the sample. Every 22nd school was selected until a sample of fourteen schools was reached. Fifty questionnaires were sent to each selected school with an instruction to the school principal that ten questionnaires be given to the learners of each grade. Of 700 questionnaires mailed, 355 were returned which represented a return of 51 percent. Frequency distribution which showed all the scores in each item of the questionnaire was used to tabulate data. Frequency data was converted to percentages indicating the number of

the respondents who marked a particular item in relation to the total number of respondents. Frequency tables were used to indicate responses to integrated science process skills items. Data were also subjected to the measure of the central tendency of arithmetic mean. The means procedure was used to establish if geography teachers applied integrated science process skills to their teaching. After descriptive statistics, inferences were made to predict the similarity of the sample to the geography learner population from which the sample was drawn. The learners' responses were used to conduct a series of one-way ANOVAs to determine if there were any statistically significant differences among gender, grade and type of school to the integrated science process skills.

Research Findings and Analysis

Table 1 Perceptions of geography learners of their teachers' application of integrated science process skills (ISPS) expressed as percentage (%) scores N=355

Questionnaire items on integrated science process skills	**Never**	**Sometimes**	**Often**	**Always**
1. My geography teacher encourages us to **identify variables** that affect geographical phenomena, e.g. how variables such as air temperature, air pressure, humidity, and cloud cover influence the occurrence of rainfall.	7.0	18.0	50.2	24.8
2. My geography teacher devises exercises in which we have to **construct tables of data**.	14.1	30.1	41.7	14.1
3. My geography teacher devises exercises in which we have to **construct graphs**.	9.6	34.1	44.2	12.1
4. My geography teacher devises exercises in which we **conduct investigations**.	9.9	38.5	46.8	4.8
5. My geography teacher devises exercises in which we **identify the variables understudy**.	8.4	31.0	52.7	7.9
6. My geography teacher gives geographical problems in which we are encouraged to **construct hypotheses**.	13.5	31.6	45.4	9.6
7. My geography teacher gives us exercises in which we are encouraged to **define** geographical features by using observable characteristics of the features.	11.3	24.8	47.6	16.3
8. My geography teacher gives us hypotheses and requests us to **design investigations** to test the given hypotheses.	13.5	49.9	29.9	6.7
9. My geography teacher devises exercises in which we have to **describe the relationship between variables** on a graph.	7.6	37.8	42.2	12.4

The learners' responses to items 1 to 9 of the questionnaire enabled the researcher to apply the means procedure to establish the extent to which learners perceived their teachers' application of integrated science process skills to the teaching of geography. Analysis of this table shows that most responses are reflected on the sometimes Likert scale. This is also confirmed by the table below.

Table 2 The means procedure for the application of integrated science process skills (ISPS) according to the responses of geography learners

Variable	N	Mean	Standard Deviation	Minimum	Maximum
ISPS	355	2.6	0.5	1.1	4.0

Data in Table 2 show that the arithmetic mean is 2.6. This mean implies that learners perceive that their teachers apply integrated science process skills to the teaching of geography.

The following table shows how the learners rank their teachers' application of integrated science process skills in the geography classroom.

Table 3 Learners' perceptions of their teachers' application of integrated science process skills to the teaching of geography by ranked order as percent (%) scores (N=355)

Integrated science process skills	**Learners' perceptions of their teachers' application of integrated science process skills by ranked order expressed as percentage scores**
Identifying variables that affect geographical phenomena	14.7
Defining geographical features using observable characteristics of the features	12.5
Identifying the variables understudy	11.9
Plotting a graph	11.1
Constructing a table of data	11.0
Constructing hypotheses	10.9
Describing the relationship between variables on a graph	10.7
Conducting investigations	10.1
Designing investigations to test given hypotheses	7.1

Table 3 shows that, according to the learners' perceptions, tasks in which teachers encourage learners to identify variables that affect geographical phenomena are given most of the time. Exercises in which teachers give learners hypotheses and request them to design investigations to test the given hypotheses are applied less. These findings suggest that, according to the perception of learners, some geography learners were exposed to a limited number of integrated science process skills, even though experiments were rarely conducted in most geography classrooms.

The results of one-way ANOVAs were computed to determine if there were statistically significant differences according to gender, school type and grade. The researcher maintained an overall significance level of 0.05 and set the exceedance probability level at 0.0167.

Table 4 One-way ANOVA for the application of integrated science process skills

Variable	Mean	Standard Deviation	F Value	Pr > F
Gender:			2.68	0.1024
Male	2.58	0.5		
Female	2.61	0.5		
School Type:			0.47	0.4918
Public	2.59	0.5		
Private	2.55	0.6		
Grade:			5.41	0.0003
Grade 8	2.48	0.5		
Grade 9	2.73	0.5		
Grade 10	2.57	0.5		
Grade 11	2.67	0.5		
Grade 12	2.33	0.6		

A series of one-way ANOVAs were conducted on learners' responses and statistically significant differences were found for gender, type of school and grade as independent variables with respect to integrated sciences process skills as a dependent variable. The mean statistics for the Free State province were 2.58.

The F-value for gender was 2.68 and Pr > F was 0.1024. This indicates a statistically significant difference exists between males and female learners. The results of the analyses indicate that female learners have a higher perception score (mean = 2.61) than male learners (mean = 2.58) with regard to their teachers' application of integrated science process skills to the teaching of geography.

The F-value for type of school was 0.47 and Pr > F was 0.4918. This indicates that there is no statistically significant difference between learners at public schools and learners at private schools. Further examination of the results divulges that learners at private schools have a perception mean score of 2.55 whilst learners at public secondary schools have a perception mean score of 2.59 with regard to their teachers' application of integrated science process skills to the teaching of geography. .

The F-value for grade was 5.41 and Pr > F was 0.0003. This indicates that a statistically significant difference exists between learners of different grades. Further review of the results reveals that grade 9 learners have a higher perception score (mean = 2.73) than learners at other grades with respect to their teachers' application of integrated science process skills to the teaching of geography. Means for learners at other grades were as follows: grade 11 = 2.64, grade 10 = 2.57, grade 8 = 2.48 and grade 12 = 2.33. These means indicated that grade 12 learners' perceptions of their teachers' application of integrated science process skills to the teaching of geography were the lowest.

Discussion

The findings suggest that geography teachers are not always applying integrated science process skills in their teaching. Rezba *et al.* (1995) suggest that learning these skills qualifies learners to answer many of their own questions, which implies that learners may be able to

interpret geographical phenomena they observe and design geographical experiments to test their ideas. The development of the process skill of defining variables operationally could assist learners to communicate scientifically using terms that have definite operational meanings. Learners may also identify and explain what they regard as being the necessary condition for an experiment to be repeated successfully. The development of this skill also equips learners with the ability to construct operational definitions in problems that are new to them. Learners may also hypothesize the definitions of phenomena until they arrive at the best definition for those specific phenomena. Mhlongo (1996) suggests that the skill of hypothesizing may be developed from practical work, rather than from teacher questions. The involvement of learners in hypothesis-testing activities empowers them to derive useful and practical information from a hypothesis. It stimulates learners' interest in finding the relationship between existing variables. Zeitler and Barufaldi (1988) argue that manipulating and controlling of variables begins when the investigator selects a variable to be changed or observed. They recommend that one variable should be manipulated at a time. If more than one variable is manipulated, it may not be easy for the investigator to determine the variable that has produced the result. The investigator may also not be able to determine if a combination of variables has produced the result. When teaching the skill of acquiring and processing data, teachers should plan the data collection procedure beforehand because this procedure enables learners to answer the question or solve the problem. Learners select their data gathering instruments which could be literature sources, questionnaires, interviews or actual observation of a geographical phenomenon. Data sources could be either primary or secondary. The use of primary sources offers learners the opportunity to organize and analyze their own data. However, time and cost constraints may cause learners to use relevant secondary sources. In order to determine the validity of a hypothesis, learners are taught to analyze the results of their investigations. The skill of interpreting data empowers learners to organize their gathered data and make generalisations which are supported by their findings. Zeitler and Barufaldi (1988) observe that interpreting means asking the question – "*What do the data and information mean?*" The interpretation of data may not be possible without experimenting, which involves carrying out an experiment by cautiously following guidelines of the process so the results can be corroborated by repeating the process numerous times. Experimenting requires the integration of all other science process skills. Experimenting activities in geography comply with the specific skills suggested in the Curriculum and Assessment Policy Statement (CAPS) which could contribute to the development of citizens who might conduct their lives with confidence in the 21st century.

Recommendation

The results of this paper highlight the need for providing geography teachers with training in science process skills. Jaus (1995) established that pre-service and in-service teachers trained in science process skills accomplished competence in these skills. Bluhm (1979) suggests that teachers should be trained in science process skills using a manipulative "hands-on" approach which include activities designed to teach these skills. This implies that teachers' knowledge and ability to use science process skills could be integrated with teacher retraining programmes in CAPS. Geography methodology modules at universities should be structured in such a way that pre-service teachers are able to understand how science process skills could be used in geography experiments. Geography teachers should make provision for experiments in their lessons. Geography subject advisors could assist in the identification of materials which teachers could improvise from the environment to conduct geography experiments to increase the application of integrated science process skills in the geography classrooms.

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Teachers' Knowledge on Mathematical Task Design in Classroom Trough Lesson Study and Open Approach: Case of Teachers at Attachment Primary School, Pakse Teacher Training College, Lao People's Democratic Republic

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Abstract

The research aimed to investigated teachers' knowledge on mathematical task design through Lesson Study and Open Approach. The target group was teachers from Attached Primary school of Pakse Teacher Training College in Lao PDR. Data collected in the second semester of the 2016-2017 academic year. Research Methodology base on Lesson Study and Open Approach. The data were from video recording and taking field notes during the process of Lesson Study. The data include interviewing teacher and students' worksheet. Data analysis based on the three-step flow of lesson (Inprasitha, 2016). The result revealed that the target group teacher had knowledge on representations of the real world and mathematical world. But they lack of and need to improve on mathematical content knowledge and creating knowledge on teaching materials (Semi-concrete Aids).

Keyword: *Mathematical task, task design, teacher knowledge, lesson study, open approach*

Introduction

Lao PDR had practical training about Open Approach and Lesson Study for Mathematics and science teachers in 2002 (Hoshino's Project) (Minsai Center Laos, 2002 cited in Linphitham, 2009; Inprasitha, 2007 and Inprasitha, 2014). Later, The Lesson Study was introduced in Lao PDR, 2004, supported by JICA (Japan International Cooperation Agency). This educational innovation employed to develop learning and teaching in Mathematics and increased knowledge of collegial teaching. (Saito, 2007). In the contrast, teachers were unable to get in depth understanding of teaching methodology and classroom management and teaching as student centered (Ministry of Education and Sports, 2014). Ministry of Education and Sports established the teacher department (2014). It supported educational policy and encouraged teaching as student centered through Lesson Study in Teacher Institutes. For this reason, Pakse Teacher Training College provided Lesson Study Training for teachers who taught in elementary schools to universities lectured by Assoc Prof

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Dr. Maitree Inprasitha and experts in educational innovation and Open Approach (Pakse Teacher Training College, 2016)

Lesson study played important role in teacher profession and education system development in Japan. It supported concreted learning and teaching and a new perspective for teachers. It assisted the teacher in lesson planning and develop teacher profession. (Takahashi et al., 2006) and Isoda et al. (2007) stated Lesson Study was not only training for teachers but also supporting teaching, and work collaboratively with teachers in making lesson plan (Baba, 2007; Inprasitha, 2013). Lesson Study was introduced and employed in schools in Thailand in 2002. It composed of planning, observation, and reflection of teachers when they finished their class. They assisted each other to figure out problems of mathematics activities through Open Approach (Inprasitha, 2011). Open Approach teaching was to foster and their mathematical thinking in problem-solving simultaneously. In other words, mathematical thinking must be carried out to the fullest extent. Then, it is necessary for each student to have the individual freedom to progress in problem solving according to his or her own abilities and interests (Inprasitha, 2016). The important heart of Open Approach focused on the different individual ability of students. It fostered and extended students' concept and part of Open Approach comprised of Situation Problem and Tasks (Inprasitha, 2014)

The teachers, researchers and mathematical communities taught mathematics were interested in task design because it was important in research perspective and mathematics education practice (Job and Schneider, 2013; Wason and Ohtani, 2015). The mathematical task was important for learning and teaching and it supported mathematical learning environment (Simon and Tzur, 2004; Clarke and Roche, 2010). Task design was a tool shaped thinking development, mathematical reasoning and encouraged students to have higher learning result (Stein et al., 1996; Shimizu et al., 2010; Henhaffer, 2014). According to Fujii (2013) pointed out that the task design through Lesson Study related to activities, namely students' problematic solution expectation when they wrote the lesson plan, classroom observation and the effectiveness evaluation of students' problem solution. factors affected to teacher's mathematical content knowledge, teacher's knowledge on students and lesson purpose (Henningsen and Stein, 1997)

Cannon (2008) stated that students teachers were lack of specific content knowledge on task design. Lee, Lee & Park (2013) mentioned teacher's knowledge was a potential factor because it was used to analyzed and adapted task design implementing in the classroom. Knowledge created concept development in specific content scope. It revealed minded inside the structure because it developed thinking process (Jones et al., 2002). As a result, Teachers' knowledge modification and task design issue was meaningful for students. It was necessary to improve in teacher education.(Lee, Lee, & Park, 2013)

According to to the importance and issue above, Lesson Study supported teacher community and improved knowledge linked to other knowledge such as content knowledge, pedagogical content knowledge, knowledge of students. This knowledge could be improved and employed in the classroom (Murata, 2011). But there were not researches were done about teacher knowledge on mathematical task design through Open Approach and Lesson Study at Attachment Elementary School, Pakse Teacher Training College, Lao PDR. Therefore, the researcher was interested in the study of task design and it would be a guideline for developing task design.

Research Purpose

To investigated teachers' knowledge on mathematical task design through Lesson Study and Open Approach.

Definition

1. **The mathematical task design knowledge** meant mathematical content knowledge supported by students' thinking process.

1.1 **The content knowledge of mathematical task design** meant knowledge about subject matter analysis involve conceptual, mathematical problem-solving process and technique in teachers. setting the purpose of task design to match with content and students.

1.2 **Knowledge about students in mathematical task design** meant teachers' ability in problem-solving anticipation of students, learning difficulty anticipation, and emotional understanding in learning Mathematics and interests of students toward mathematical content.

2. **Lesson Study** meant teachers or researchers' document study and collaboration for planning for task design and then employed it with students in the classroom. Teachers observed students' behaviors on task during class and have a reflection about mathematical task design after class. (Inprasitha, 2011)

3. **Open Approach** meant the type of teaching approach which employed open ended problem in creating the problem situation. The mathematical task had to encourage student's thinking development; they could choose the answers correctly to answer questions in learning Mathematics Based on Inprasitha (2011), the answer methods comprised of 4 concepts 1. Posing mathematical task, 2. Students solve the mathematical task by themselves, 3. Discussion and comparison in the classroom. 4. Mathematical concept conclusion in the classroom.

Design/Procedure

1. **Target group**: Five teachers who taught at Attachment Elementary School, Pakse Teacher Training College, Lao PDR., Pakse Teacher Training College, Lao PDR. This target group had experienced in employing innovation through Open Approach. It included four phases as follows.

Phase I: The target group participated in educational innovative through Lesson Study and Open Approach training. The training content was about mathematical textbooks emphasized problem-solving under the lecturing by Assoc Prof Dr. Maitree Inprasitha and professors from Center Research for Mathematics Education from August 28, 2016, to August 29, 2016, at Pakse Teacher Traininng College, Pakse District, Champasack Province.

Phase II: The target group participated in the field trip of classroom innovation in schools employed innovation under mathematical higher order thinking project from Center Research for Mathematics Education, Faculty of Education, Khon khaen University on November 7, 2016, to November 9, 2016. The project had run more than 10 years.

Phase III: The target group got involved in real practice in three months with two master degree students from Mathematics Education, Faculty of Education, Khon khaen University. The first period was to create context from February to March 2017. The second period was to collect data in employing innovation in the classroom in April 2017

Phase IV: The target group studied and trained about educational innovation employment in the classroom. They learned analytic perspective and received the recommendation from Mathematical education experts, Khon Kaen University. They followed Master degree students' research progression when they employed and

implemented this education innovation – Lesson study and Open Approach, at Attachment primary school, Pakse Teacher Training College on April 28, 2017.

2. **Research tool**: Video recording, camera recording students' worksheet, teachers' interview form and portfolio used for field note during the process of Lesson Study.

3. **Data collection**

The procedure was in the second semester, started from February to April 2017. It detailed as follows.

3.1 Before data collection.

Studied literature review, selected target group and researcher assistants who were responsible for fielding note, recording video, etc.

3.2 Process of Data collection

The created context of the target group, teachers, and researcher assistant collaboration. The process conducted through Lesson study and Open Approach and then conducted data collection with prepared instruments in process of study.

4. **Conceptual framework**

The researcher analyzed data relied on the conceptual framework of mathematical activity designing. The activities emphasized on mathematical employment into real life. It based on Flow of Lesson comprised of 3 steps 1. (Representations of Real world) 2. (Semi Concrete Aids) 3. (Representations of Mathematical World) (Inprasitha, 2016).

Analysis

Specimen: the result of data analysis of teachers' task design and learning plan in activity "Plus 2". The naughty monkey

Problem Situation "There were five monkeys were eating fruits and then there were six monkeys running to join the fruits. How many moneys were there? "

Instruction "Students write sentence symbol and find the answers"

1. Teachers' knowledge on Representations of Real world

1.1 Mathematical content knowledge

Protocol in planning

Item7 Teacher 3 : Students made understanding of adding number to be ten

Item9 Teacher 4 : Students had to make understanding of adding the number to ten and then students divided number. Students knew it was eleven and then told them to divide it.

The protocol of Item 7 and Item 9 showed content analysis about ten divisions. Teachers knew how to deduct the number and plus it. They wanted students knowing how to plus number. This meant teachers had mathematical content knowledge in Math solution.

1.2 Students' mathematical knowledge

Protocol in planning

Item23 Teacher 1 : Student would be heard addition because they used to learn before. There were six sum of moneys running to five monkeys, they might solve the problem.

Item34 Teacher 2 : They could not write the answer and it would be in speech. Some students thought there were two monkeys on the tree and left on the land and five monkeys were in speech.

The protocol of Item 23 shown teacher understood students' words for comparing "running to five monkeys." This meant number addition was familiar with students. Item 34 teachers assumed students' problem solving based on the picture of the monkey, students could explain about the number of monkeys when it added the number. The teacher tried to interpret students' thinking with number addition when another group of money running to join one.

Protocol in reflection

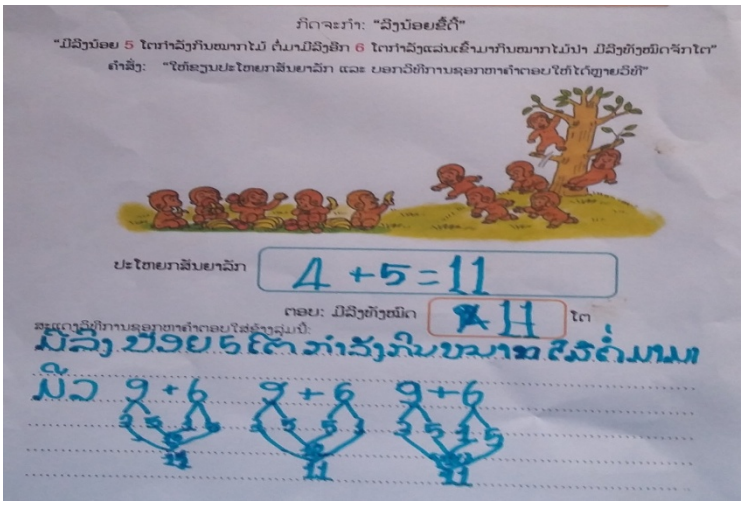
The protocol of item 7 showed the mathematical education perspective of experts in reflection. It reflected monkeys eating fruits was a real world for students. The monkey's picture was no problem, students could explain the picture. This meant students understood real world and picture. Item 5 reflected problems which encouraged students knowing monkeys and its real world, group separation eating fruit and another group running to join one. It meant teacher had knowledge of Students on represented of the real world.

2. Teachers' knowledge of semi Concrete Aids

2.1 Mathematical content knowledge

The protocol on learning reflection

The reflection protocol in item 5: The experts' perspective of mathematics education, Faculty of Education, Khon Kaen University, reflected students added 4 + 5 or 9 + 6 in step and step in semi concrete aids. They connected concrete aids in vertical to help the student write sentence symbol. It reflected teacher were lack of mathematical content knowledge on represented semi concrete aids as student' worksheet shown



The picture shown mathematical problem solution

2.2 Students' mathematical knowledge

The protocol in reflection period

The protocol in the reflection of item 5: In the perspective of experts in Mathematics education, Faculty of Education, Khon Kaen University, reflected teachers' expectation deal with problem-solving how teachers eliminated problems when it occurred without expectation. It was difficult for teachers if they did not know to overcome the problems step by step. In addition, teachers considered which teaching materials to be used and when it was used in the classroom. It should be used to be matched with the learning environment and students as well. The reflection showed that teacher did not reach students in teaching and they did not enough Students' mathematical knowledge to task design on represented semi concrete aids.

3. The knowledge on representations of Mathematical world

3.1 The mathematical content knowledge

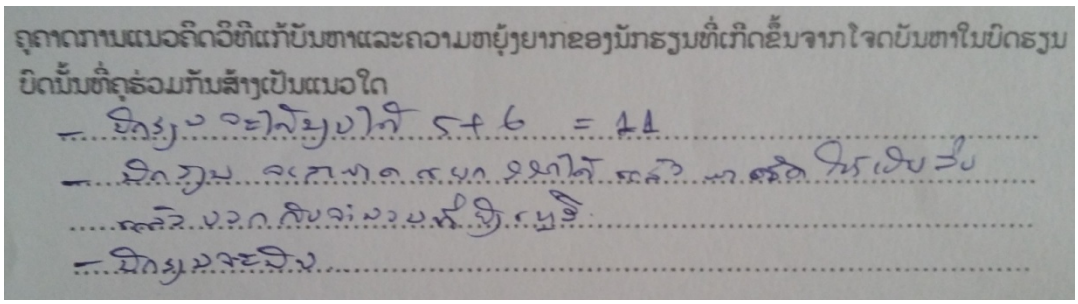
The protocol of learning management

Item15	teacher 6	:	The picture showed there were six sum of moneys on the tree and how added number to be ten. It was 5+5 and 1 equal 11
Item16	teacher 1	:	The first number was 5 and 6

The protocol of item 16 shown teachers analyzed content from monkey picture with number 5 and 6 and item 15 shown teacher analyzed content about how to add the number to be 10, with 5+5 and 1. According to number addition above, it is shown that teacher had mathematical content knowledge. They analyzed with Algebra incorporating the knowledge of task design on representations of Mathematical world

3.2 Students' mathematical knowledge

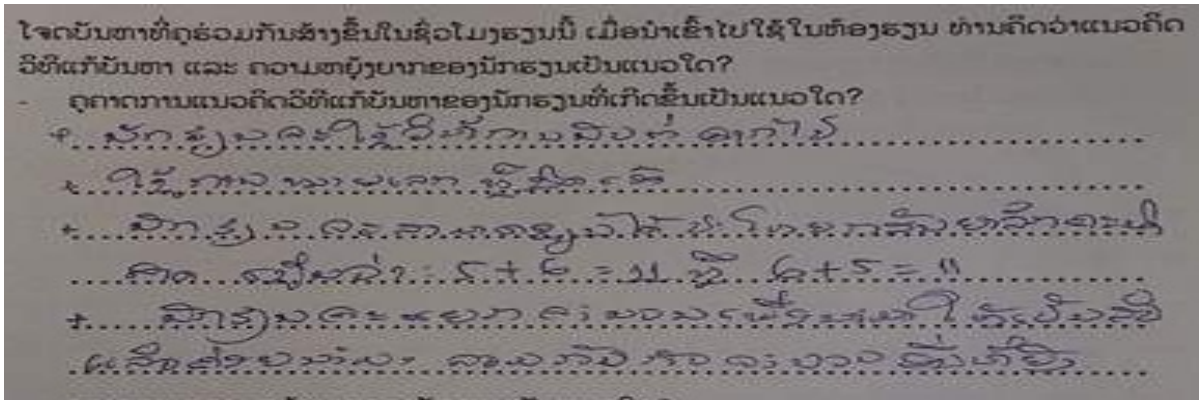
The field note of research assistant in planning



Teacher assumes the students' concept in mathematical problem-solving in task design
- Students answered 5+6=11
- Students enabled to divide number and added it

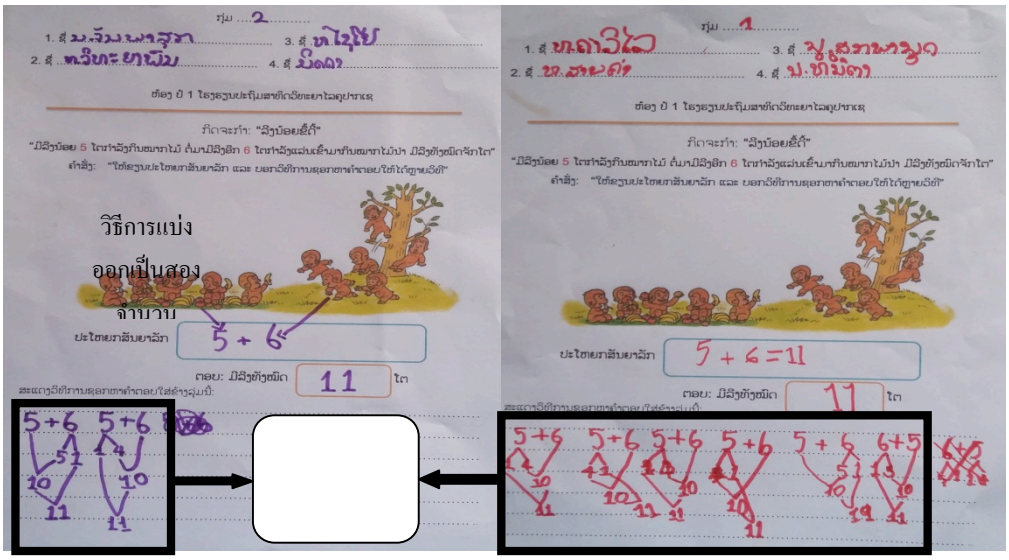
According to field note, it showed teacher could assume the students' concept in mathematical problem solving with questions created by teachers. Student enabled to answer 5+6=11 and they enabled to divide number and added it.

The information of teacher interview



- The questions were created by teachers and it employed in the classroom. How did you think it enabled to solve mathematical questions and how was it difficult?
- How did teacher assume students' question-solving?
- Students enabled to write sentence simple as 5+6=11 or 6+5+11
- Students enabled to divide number and added it

According to teachers' interview form shown teacher had the ability to assume students' question-solving. Students enabled to write sentence symbol of Mathematics as 5+6=11 or 6+5=11. Students enabled to divide number and added it



The picture illustrated the number division derived from sentence symbol writing of Mathematics as 5+6=11. It showed teacher had knowledge of Students in mathematical task design on representations of Mathematical world

Finding

The target group teacher lack and need to improve on mathematical content knowledge and creating knowledge on teaching materials (Semi-concrete Aids) because they were lack of content analysis representation Semi - concrete Aids. also, they did not experience on problematic solution anticipation with students and without prediction. Regarding Cannon (2008) found students teacher were lack of specific content knowledge in mathematical task design and employed the content in teaching. Lee, Lee & Park (2013). It was challenging task for teachers in new task design because it required knowledge and experiences.

Recommendation

1. Employment recommendation

The teachers consider employing educational innovation as Lesson Study and Open Approach in their teaching. They should have opportunities participating in training about Mathematics textbooks employment through Lesson Study and Open Approach. Also, they should receive opportunities to visit original schools were employed educational innovation and get experience with it. They have to study about Representations of Real world, Semi Concrete Aids, and Representations of Mathematical World

2. Research recommendation

The planning creation and mathematical task design should explicitly separate in correct content in planning. The task design related to the content of teaching. Students are able to employ the concept of each class to be the tool in further learning.

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The Correlation Between Education Background and Student's Grade Point Average (GPA) In Special Education Department Faculty of Education (FIP) Universitas Negeri Makasar (UNM)

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Abstract

Students of Special Education Department FIP UNM come from varied educational backgrounds and also have the various Grade Point Average (GPA). So that the aim of this research are : 1) How is the description of the educational background of students from the Special Education Department FIP UNM ? 2) How is the description of Grade Point Average (GPA) students of Special Education Department FIP UNM? 3) ls there any significant correlation between educational background in high school and Grade Point Average (GPA) of students in Special Education Department FIP UNM? This research uses a quantitative approach through correlation test. The study population was a student in Special Education Students, while the sample is the students from class of 2014 and 2015. The data collection used documentation on SIMPADU. The results that: 1) The educational background of the students of Special Education Department FIP UNM dominated by Science Major from senior high school. 2) GPA level of level of the students of Special Education Department FIP UNM is at the high category. 3) Educational background is one of the factor that correlated with GPA of the students of Special Education Department FIP UNM. This correlation is possible because the educational background that dominant is science majors which inextricably linked with some of the subjects taught in the Special Education Department. So that finding of this study is tif a student has the educational background that corresponds to his chosen field in college, then chances of high GPA will be easy. These findings also reinforce previous findings, although with different content.

Keywords: *Background of Education*

Introduction

Admissions to the Department of Special Education (PLB) State University of Makassar every year is in three lines, namely SMNPTN lane, lane SBNPTN and independent pathways. Each path has its own terms. But there are no restrictions on the educational background for students who enroll in the intended lane. That is, prospective students, can enroll high school education background, MA (Moslem Senior High School), and SMK (Vocational High School) are essential to meet the requirements as students.

Input from the acceptance of prospective students Department of PLB comes from high school education background, MA, and SMK with different majors. There are from SMA (Senior High School) and MA with majoring in Science, IPS (Social Science) , and Language. There is of SMK majors such as computer engineering, automotive, electrical, nursing, hospitality, and accounting. After going through the selection process they are declared as new students who then follow the lecture process. There is no difference in the treatment and use of facilities to students both high school educational backgrounds, MA, and

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SMK with each department during the lecture. But in the end after the completion of the courses, they have an index point average (GPA) are different from each other. Academic achievement in students can be seen through the average weighting value which is usually called the Achievement Index (IP). In the academic setting book, it is explained that the Achievement Index is differentiated from the Continuing Semester Achievement Index (IPS) and the GPA (Grade Point Average). Calculation of Cumulative Achievement Index is done at the end of the semester, by calculating the value that has been entered in the semester in question. Cumulative Achievement Index is used as input material for evaluation of student study success and academic sanction determination.

GPA (IPK) is a form of students' ability to complete the course in a few semestersor have completed all the courses and thesis preparation. GPA is obtained from various lecture activities. For example, the ability to complete the task given by the lecturer, show the ability to argue, get the value in taking the middle and final exams for each course. The accumulation of achievement obtained by students in each subject in several semesters is the value of IPK. Cumulative Achievement Index (GPA) is a measure of student achievement during the lectures in their respective majors and determine to be in the category where the ability of the student. According to data from the Department of PLB SIMPADU FIP UNM student grade point index of FIP UNM Department of Special Education is in the range between 2.33 to 3.91.

According to the assumption, students with science education background are easier to understand and follow the lecture than the students with IPS background, especially Language and engineering and hospitality classes, as well as nurse clumps. SMK engineering and hospitality group has absolutely no basis and relationship with the subject in the Department of Special Education FIP UNM. While a little virginity SMK still has to do with subjects majoring in Extraordinary Education. Another assumption that the vocational school students are prepared to work after completing school lessons. In contrast to high school and MA students who are prepared to continue their education to a higher level. For students who want to continue their studies to college.

Whether the assumption is true or not requires research to prove it. Therefore, conducted research on, correlation of educational background in this department majoring in SLA with cumulative achievement index of students majoring in Special Education FIP UNM. Through this research will be obtained a description of whether there is a significant relationship with the educational background of the GPA and the contribution of the educational background of the student GPA.

Literature Review

Senior High School (SMA) is a school that can be a good preparation period. This is because the majors program usually starts in high school (Purnama, 2010). According Siswoyo (2010) the superiority of Senior High School (SMA) in particular is in the mastery of concepts, ways of thinking, performance as stock to the next education. Senior High School (SMA) is prepared to advance to a higher level, namely bench lectures. Siswoyo (2010) adds that students who are in Vocational High School, not only learn but can channel the hobby of students. This is because the Vocational High School has a particular advantage in terms of mastery of skills that can be directly used as working capital. Vocational High School graduates are prepared to directly face the world of work. But for SMK alumni do not close the possibility to continue school especially if pass the selection. The data obtained

from the Department of Special Education shows that students enrolled come from backgrounds different majors.Sirodjuddin (2008) distinguishes learning method in High School and Vocational High School which include the High School given more theory than practice and just teach the basics of science (a kind of scientific foundation) in students.

Learning has inspired some experts to express their opinions about learning through in-depth analysis. Slameto (2003: 2) argues that learning is a process by individuals to achieve a change in behavior, knowledge, skills and preferences as a result of the individual's own experience in interaction with the environment. Sardiman (2001: 20) states that learning is always a change in behavior or appearance, with a series of activities, for example by reading, watching, listening, imitating, and so forth. According to De Houwer, Barnes-Holmes, and Moors (2013) define learning as ontogenetic adaptation-that is, as a change in the behavior of an organism. This functional definition not only solves the problems of cognitive learning research. Grade, commonly abbreviated as IP, is one measure educational achievement. Although named "index", the real IP is not an index in the real sense, but rather a sort of weighted averages. Grade Point Average (GPA) is a number that indicates the student's study achievement or success of the first half until the last half of that has been taken cumulatively. At the higher education level, the IP is calculated as the average value norm obtained by a student in that course after being weighted with "Credit Score". The value norms range from 4 (A, best) to 0 (E, fail). Credit Score is determined magnitude (typically 1 to 4 Semester Credit / SKS) based on the weight of each course

Design/Procedure

The approach of this research is quantitative approach with correlation method. Using correlation techniques to see a significant relationship between educational background with a grade point average (GPA) of Student in Special Education Department FIP UNM. The population of this study is the students of the Department of Special Education FIP UNM is still active starting from the force of 2014 and 2015 with the number of 120 people. Data collection technique used documentation techniques either manually or online through S1MPADU. Data technique analysis using the correlation coefficient contingency percentage.

Findings/Analysis

Department of Special Education Students come from varied educational backgrounds. Data on educational background majoring origin in secondary schools can be seen in Table 1 below:

Table 1: Background Data / Department of Student Origin Department of PLB FIP UNM

No.	Department of Student Origin	amount	%
1	Science	70	58.82
2	Social Science	32	26.89
3	LANGUAGES AND SMK	17	14.29
AMOUNT		**119**	**100**

The data in Table 1 show that more than half of FIP UNM students majoring in special education (58.82%) have an educational background majoring in **science,** followed by the Social Sciences (26.89%), language and vocational (14.29%). Data obtained from the study

also showed that students from SMK consists of department of nursing, informatics and network engineering, automotive, and fashion.

For the purposes of analysis, the GPA variables are divided into 3 groups: high, medium, and low. The data can be seen in Table 2 below.

Table 2: Student Achievement Index Data Department PLB FIP UNM

No	GPA	amount	%
1	HIGH	66	55.46
2	MEDIUM	46	38.66
3	LOW	7	5.88
AMOUNT		**119**	**100**

The data in Table 2 indicates that half of the population of students of Department of Special Education FIP UNM (55.46%) had a high GPA is in the category that is in the range of 3.50 - 4:00. For the category of being or a range of 3.00 to 3.49, the percentage of students who occupy these positions is 38.66% and for lower categories or a GPA of below 3, is occupied by several students only or by 5.88%. It can be concluded that the average GPA of FIP UNM students of special education at the high category.

After going through the calculation process then the results obtained can be seen in table 3 below:

Table 3: Analysis Cross Tabulation educational background (originally Department) with IKP PLB student of FIP UNM.

ASALJURUSAN * IPK Crosstabulation

Count

		IPK			
		1	2	3	Total
ASALJURUSAN	1	46	23	1	70
	2	13	15	4	32
	3	7	8	2	17
Total		66	46	7	119

To see the correlation between educational background with a GPA of students of PLB FIP UNM, used Correlation Coefficient Contingency. The results can be seen in table 4 below.

Table 4: Results of Contingency Coefficient Correlation Calculation

Symmetric Measures

		Value	Approximate Significance
Nominal by Nominal	Contingency Coefficient	,284	,034
N of Valid Cases		119	

Based on the criteria established that the *approximate significant* if less than 0.05 then Ho is rejected. The results of the correlation coefficient calculation contingency indicates that *significani approximate* value is 0.034. This means that the calculation result is smaller than 0.05 or 0.034 <0.05. Ho who reads no significant relationship between educational background with a grade point average (GPA) students of FIP UNM PLB rejected. The

consequence is that the Hi which says there is a significant correlation between educational background with a grade point average (GPA) of students of special education received FIP UNM.

Based on the calculation and analysis of the criteria established, the conclusion that can be drawn on the outcome of this study is a significant relationship between educational background with a grade point average (GPA) of FIP UNM students of special education. This conclusion will be discussed in the discussion of the results of research to confirm some of the results that are relevant to the discussion and theories that support the results of the research.

Description about the educational background shows that most students of PLB FIP UNM educational background of SMA and MA majoring in science, and social studies, language and vocational further. There is no requirement specified that to become a student in the Department of PLB should be an educational background in science majors.Opportunities for all majors are the same. Even in this study it was found that there was a student of PLB backgrounds of majoring in automotive vocational education and fashion vocational school. New admissions system for the Department of PLB enter the IPS group, but that many are those whose background sign IPA. It is worth exploring why.

For determining the direction, a lot of confusion that must be faced by high school students of class XII them confusion in choosing majors in college to continue his studies this is related to their interests, talents and abilities of the individual. confusion in deciding to choose courses that are on the course because the number of majors offered so difficult to make a decision to choose a major. Difficulty in making selection decisions subject because there is doubt over the interests and talents of individuals, the lack of information on the subject is available in the universities and the lack of ability to weigh and make the alternative choice of majors.

Description of the GPA student of FIP UNM PLB is that of grouping the set, find groups of students with high GPA occupies the largest amount. Almost half of the study population had a high GPA. This achievement shows that the ability of students of special education in mastering subjects was high. GPA or grade point average student is a parameter of success of students in the academic world, how he underwent a course that has been taken. Nowadays, IP is important especially to continue their education to the nextlevel and the first song with the track scholarship, IP has become a very important aspect. But not everything. At the beginning of applying for a job is largely minimal vacancies IP list as the administrative requirements (Kompasiana, 20 I 2).

The conclusion of the research result is that there is a significant correlation between educational background with grade point average (GPA) student of FIP Department of Extraordinary Education Department of Makassar State University. This conclusion is obtained based on the calculation and analysis of cross tabulation. The result of cross tabulation shows that students who have educational background with science majors have 1PK high. The results of this study support the results of research from Abdullahi and Umar (2013) that there is a significant relationship between educational background qualifications with performance in the MBA program. Educational background becomes an important variable in student achievement.

Research on the educational background of students associated with IPK has been done by researchers with different settings. There are done to students from the exact sciences and from other majors. There are results that are closely linked there is also no relationship.

Student grade point average (GPA) is a proof of achievement achieved by a student during college. GPA is the accumulation of the value of all the fields of study that have been dilulusan by students divided by the number of credits that have been taken. As a learning achievement, the students obtained GPA is also influenced by several factors. Riyani (2012) found there were 13 variables that influence learning achievement that is the purpose of learning, teaching materials, tools, motivation, teaching and learning, methods, resources, evaluation, student, student to student interactions, environment, health and talent. The thirteen variables are reduced to 4 factors formed, Factor 1 consists of Teaching and Learning Process, Method, Source and Student, Factor 2 consists of Teaching Materials, Tools, Motivation and Evaluation, Factor 3 consists of Student Interaction with material, Environment and Health while Factor 4 consists of Goals and Talents. Apparently none of the influence factors is the educational background. The study did not examine the background of the students but what is happening right now.

Based on the majors, Pusparia and Fakhrurrozi (2008) says that students majoring in science tend to have higher motivation of underachievement than students majoring in social studies and English. The level of competition in science majors is quite high so it requires all students to study hard. Sabirin et al (2013) also found that students who feel appropriate field of study that was involved and there is an interest in subjects that are programmed likely to have passion in running the college. This certainly encourages students to learn more getter, and work together so do not rule out the student can obtain a good learning performance. F. Kopf, Gewald H., Brune P. (2014) concluded his research that people who have the same educational background will enhance cooperation. Instead achievement of students will be allowed to decline if not accompanied by a sense of interest in the courses programmed and suitability field of study involved. This ability is the capital of achievements in studying in college.

In addition to the achievements of capital that has been owned by the students right from secondary school, some subjects in the department of FIP UNM PLB is a subject which is closely related to clump IPA. The courses in question include anatomy, physiology, and genetics, anatomy of the brain and spine, ophthalmology and neurology. Coupled with statistical courses and research methods. Selvig, D., et al (2014) found that students with previous experience of histology or pathology or biomedicine will understand well about histology. Students already have the basics that are very relevant to these subjects. Surely this is an asset to excel in college because it has had previous experience.

Unlike students who come from IPS or Language majors. Both departments are still studying math and science but not as deep as the science majors and usually only a few hours a week. Even in the 2nd and 3rd grades of 1PS and Language no longer studying science subjects. So the acquisition of knowledge about IPA less. It can be concluded that if the student has had prior knowledge of the opportunity to have a very high 1PK possible.

Other studies considered relevant to the findings of this research is research conducted by Kurniawan (2015). His findings were that high school mathematics achievement positively affects student GPA Accounting Department. It is known that some courses in the Accounting Department rely on the ability to count. This means that students who have achievement in the subjects of mathematics during high school has the possibility of obtaining a high GPA in the Accounting Department.

The relationship between previous knowledge was also found by Nursusilowati (2016). Another fact that encountered in his research is that the development of the knowledge structure is likely influenced by the knowledge that has been owned previously *(prior knowledge)*. This finding reinforces the role of prior knowledge as a factor

related to learning achievement. Structural knowledge about special education will be strong, especially knowledge that is closely related with IPA caused by the student has the knowledge and practice of previously acquired in high school / MA.

The conclusion that can be drawn from the discussion of research results is the educational background factor has a correlation with the GPA of the students of the Department of PLB FIP UNM. This correlation is possible because the background of education / majors from the dominant students of science majors are closely related to some of the subjects taught in the Department of PLB. Theoretically, the findings of this research are that if students have educational background in accordance with their chosen field in college, then the possibility of student's GPA is high. These findings also reinforce previous findings even with different content.

Recommendation

Recommendation that can be given in this research are:

1. Choosing only prospective students with a science major background to be accepted in the department of Extraordinary Education FIP UNM is not the right decision. All prospective students are eligible to apply and be admitted to the department of Special Education. Therefore, to need a more intensive teaching and learning process so that students with backgrounds not from science majors can learn well and have a good achievement as evidenced by a high GPA.
2. Need a deeper review of the efforts to be done to improve student's GPA so that overall student's GPA is in the high category.

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Effects of Using Social Network through Problem Based Learning to Enhance English Writing Skill of Thai-Nichi Institute of Technology Undergraduate Students

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Abstract

The purposes of this research were 1) to study effects of using social network through problem based learning to enhance English writing skill of Thai-Nichi Institute of Technology undergraduate students, 2) to compare undergraduate students' English writing achievement before and after writing activities, and 3) to investigate undergraduate students' satisfaction with this type of instruction.

The subjects were 30 undergraduate students at Thai-Nichi Institute of Technology during second semester of 2016 academic year which derived through simple random sampling technique. The instruments used in this experiment were the pre-post English writing test, the English writing lesson plans based on PBL through social network, the English writing ability evaluation form and the questionnaire on students' satisfaction towards English writing instruction.

The experimental process and data collection were conducted as follows: The subjects were given an English writing ability pretest. Then, the six lesson plans were used in second semester. After the completion of each lesson, the English writing ability evaluation form, and the satisfaction questionnaire were used for surveying the subjects' satisfaction with the writing method. The data were statistically analyzed by mean scores, standard deviation, percentage and t-test for dependent samples.

The results were as follows;

1. English writing ability of undergraduate students at Thai-Nichi Institute of Technology was at good level.
2. The students' English writing achievement after learning was significantly higher than before, with instruction constructed at 0.01 level.
3. The students' satisfaction towards English writing activities based on PBL through social network was at high level..

Keywords: English Writing Instruction, Problem based Learning, Learning through Social Network.

Introduction

English has been known as an important language because of its wider use as medium of instruction, knowledge, research and social status in the world as well as in Thailand. People believe it crucial for better prospects and mobility, and attempt to accomplish capability in communication. In spite of all these, students at all levels countenance difficulties to acquire and use it for academic and daily pursuits (Ellis, 1991).

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Moreover, writing is a creative skill. It is a process of transmission message to other person. Thus, it reinforces learning, thinking and reflecting on a language. It encourages critical thinking and learning and makes the thought process noticeable. It also motivates the communication process. It has often been remarked that writing is the most difficult of the language abilities to acquire. According to the studies, it was found that Thai students' writing ability in private college was at low level. The students lack of experiences in writing and they also cannot approach to problems of writing and teaching-learning method (Laufer, 1994).

Problem Based Learning, furthermore, has been experimented as pedagogy in various disciplines and contexts around the world and recognized as effective teaching-learning method. Unlike many conservative methods it involves students for effective learning through discussing and finding solutions of real problems among themselves. The students' difficulties for communication in English writing on the one hand. From the studies about PBL's success on the other, it made the researcher to aim for experimentation with PBL and to perceive the effect of PBL on higher education level students' English writing skill. In addition, there are numerous factors which influence a learner's ability to acquire an L2 including learners' aptitude, educational setting, age, culture, motivation, attitudes and learners' identity (Lightbrown and Spada, 1999). Learners' competence in an L2 is evaluated through linguistic competence, grammatical knowledge and communicative competence, which is the ability to communicative effectively using one's grammatical knowledge (Harris, et.al, 2001).

In Thailand context, learning English writing by using problem based learning through social network is a new method. So the students need in learning various style which focuses on sociocultural or social cognitive framework, emphasising the importance of online social interactions (Thorne and Smith, 2011). Moreover, Vygotsky's (1978) sociocultural theory states that L2 learners acquire language through social interactions, both with other L2 learners and native speakers. A social cognitive approach towards L2 writing explores how learners' individual thought processes and what and how they write, are a product of their interactive relationships with teachers, peers and social contexts.

In conclusion, researcher employed social network through problem based learning to enhance English writing skill of Thai-Nichi Institute of Technology undergraduate students in order to improve writing ability of TNI students in second semester of 2016 academic year. The results derived from this research will provide guidelines for improvement and development of instruction for future course.

Research Purposes

1) To study effects of using social network through problem based learning to enhance English writing skill of Thai-Nichi Institute of Technology undergraduate students

2) To compare undergraduate students' English writing achievement before and after writing activities

3) To investigate undergraduate students' satisfaction with this type of instruction.

Research Deign

The data was gathered and analyzed as follows:

1. Population and Samples

1.1 The population is undergraduate students at Thai-Nichi Institute of Technology in second semester of 2016 academic year. There were 600 students from all faculties.

1.2 The samples consisted of 30 students who enrolled in English for Communication2 course (ENL-102), and were derived from a simple random sampling technique.

Duration in Experiment
The experiment ran for 6 weeks (22 hours)

Contents used in this experiment
Contents used in this experiment consisted of 6 topics which derived through students needs as follows:

1. Describe the house in which you grew up
2. A Scary Secret
3. My Two Homes
4. Testing in the 21st Century
5. Effects of watching too much TV
6. Describing the picture

Variables
Variables in this study were as follows:

1. The English writing ability of undergraduate TNI students before and after the class.
2. The satisfaction of undergraduate TNI students by using social network through problem based learning to enhance English writing skill

Research Instruments

1. The pre-post English writing test
2. The Problem based learning lesson plans
3. The English writing ability evaluation form
4. The learning log
5. The questionnaire on students' satisfaction with using social network through problem based learning to enhance English writing skill

Data Analysis
The collected data was analyzed using computer program. The t-test was employed to compare the subjects' English writing achievement before and after using social network through problem based learning to enhance English writing skill. The mean and standard deviations of scores from English writing evaluation form, the satisfaction questionnaire were used to measure at the end of the course.

Data Collection
The experimental process and data collection were conducted as follows: The subjects were given an English writing ability pretest. Then, the six problem-based learning lesson plans were used 22 hours in second semester. After the completion of each lesson, the English writing ability evaluation form, the learning log and the satisfaction questionnaire were used for surveying the subjects' satisfaction with using social network through problem based learning to enhance English writing skill. The data were statistically analyzed by mean scores, standard deviation, percentage and t-test for dependent samples.

Research Results

1. Results of analyze pretest and posttest scores of English writing ability test of TNI students who learned by using social network through problem based learning
The researcher used 3 item English writing ability test (3 items: 100 scores) to experiment students' ability both pretest and posttest after learning as following table:

Table1: Pretest scores of English writing ability of TNI students from 3 writing evaluators

No.	Writing evaluator1	Writing evaluator2	Writing evaluator3	Total	($\bar{x}$)	S.D.
	100	100	100	300		
1	26	30	36	92	30.66	5.03
2	27	31	39	97	32.33	6.11
3	25	32	38	95	31.66	6.50
4	30	40	41	111	37.00	6.08
5	22	30	38	90	30.00	8.00
6	32	38	40	110	36.66	4.16
7	36	40	42	118	39.33	3.05
8	32	30	40	102	34.00	5.29
9	22	32	35	89	29.66	6.80
10	30	33	41	104	34.66	5.68
11	34	38	38	110	36.66	2.30
12	26	30	32	88	29.33	3.05
13	41	43	47	131	43.66	3.05
14	25	32	35	92	30.66	5.13
15	28	35	38	101	33.66	5.13
16	21	24	32	77	25.66	5.68
17	26	28	28	82	27.33	1.15
18	33	34	39	106	35.33	3.21
19	28	35	42	105	35.00	7.00
20	26	27	28	81	27.00	1.00
21	25	28	34	87	29.00	4.58
22	27	29	29	85	28.33	1.15
23	25	30	32	87	29.00	3.60
24	25	38	38	101	33.66	7.50
25	26	30	30	86	28.66	2.30
26	23	26	34	83	27.66	5.68
27	25	33	35	93	31.00	5.29
28	26	36	38	100	33.33	6.42
29	30	37	39	106	35.33	4.72
30	31	34	35	100	33.33	2.08
Total mean scores	**27.76**	**32.76**	**36.43**	**96.96**	**32.32**	**4.56**

The table showed that pretest mean scores of TNI students in the total were at 32.32 out of 100 scores. When considered in overall of mean scores, it was found that TNI students got 96.96 out of 300 scores from 3 writing evaluators.

Table2: Posttest scores of English writing ability of TNI students from 3 writing evaluators

No.	Writing evaluator1	Writing evaluator2	Writing evaluator3	Total	Mean scores ($\bar{x}$)	S.D.
	100	100	100	300		
1	76	84	89	249	83.00	6.55
2	70	74	82	226	75.33	6.11
3	76	86	90	252	84.00	7.21
4	80	85	91	256	85.33	5.50
5	75	77	78	230	76.66	1.52

6	81	80	87	248	82.66	3.78
7	75	78	79	232	77.33	2.08
8	73	85	88	246	82.00	7.93
9	76	84	75	235	78.33	4.93
10	69	75	77	221	73.66	4.16
11	74	76	77	227	75.66	1.52
12	69	76	79	224	74.66	5.13
13	73	78	85	236	78.66	6.02
14	79	84	87	250	83.33	4.04
15	81	76	83	240	80.00	3.60
16	73	68	76	217	72.33	4.04
17	68	69	79	216	72.00	6.08
18	79	78	83	240	80.00	2.64
19	76	79	79	234	78.00	1.73
20	83	89	87	259	86.33	3.05
21	76	76	79	231	77.00	1.73
22	68	69	76	213	71.00	4.35
23	77	79	90	246	82.00	7.00
24	78	78	79	235	78.33	0.57
25	77	79	79	235	78.33	1.15
26	85	89	88	262	87.33	2.08
27	81	83	84	248	82.66	1.52
28	76	77	90	243	81.00	7.81
29	76	77	78	231	77.00	1.00
30	69	70	72	211	70.33	1.52
Total mean scores	75.63	78.60	82.20	**236.43**	**78.81**	3.88

The assessment of English writing ability of TNI students, the researcher used English writing ability test which created according to test procedure. Therefore, percentage of scores was calculated from criteria as following; (adapted from Thaweerat, 2000; Wongsothorn, 1995)

81-100 means very high
61-80 means high
41-60 means moderate
21-40 means low
1-20 means very low

The table showed that posttest mean scores of TNI students in the total were at 78.81 out of 100 scores which referred to TNI students had English writing ability at **high** level. When considered in overall of mean scores, it was found that TNI students got 236.43 out of 300 scores from 3 writing evaluators.

Table 3: Mean scores of Pretest, Posttest and difference in English writing ability of TNI students

No.	**Pretest**		**Posttest**		**Difference**
	$\bar{x}$ 1	S.D.	$\bar{x}$ 2	S.D.	D
1	30.66	5.03	83.00	6.55	52.34
2	32.33	6.11	75.33	6.11	43
3	31.66	6.50	84.00	7.21	52.34
4	37.00	6.08	85.33	5.50	48.33

5	30.00	8.00	76.66	1.52	46.66
6	36.66	4.16	82.66	3.78	46
7	39.33	3.05	77.33	2.08	34
8	34.00	5.29	82.00	7.93	48
9	29.66	6.80	78.33	4.93	48.67
10	34.66	5.68	73.66	4.16	39
11	36.66	2.30	75.66	1.52	39
12	29.33	3.05	74.66	5.13	45.33
13	43.66	3.05	78.66	6.02	35
14	30.66	5.13	83.33	4.04	52.67
15	33.66	5.13	80.00	3.60	46.34
16	25.66	5.68	72.33	4.04	44.67
17	27.33	1.15	72.00	6.08	44.67
18	35.33	3.21	80.00	2.64	44.67
19	35.00	7.00	78.00	1.73	43
20	27.00	1.00	86.33	3.05	59.33
21	29.00	4.58	77.00	1.73	48
22	28.33	1.15	71.00	4.35	42.67
23	29.00	3.60	82.00	7.00	53
24	33.66	7.50	78.33	0.57	44.67
25	28.66	2.30	78.33	1.15	49.67
26	27.66	5.68	87.33	2.08	59.67
27	31.00	5.29	82.66	1.52	51.66
28	33.33	6.42	81.00	7.81	47.67
29	35.33	4.72	77.00	1.00	41.67
30	33.33	2.08	70.33	1.52	37
Total mean scores	**32.32**	**4.56**	**78.81**	**3.88**	**46.49**

The table showed that pretest total mean scores of English writing of TNI students were at 32.32 and posttest total mean scores were at 78.81 out of 100 scores. When considered in difference of mean scores, it was found that difference of English writing ability scores of TNI students between pretest and posttest was at 46.49

Table4: Comparison of pretest and posttest mean scores in English writing ability of TNI Students

English writing ability scores	N	$\bar{x}$	S.D.	t	Sig.
Pretest	30	32.32	4.05	43.680	
Posttest	30	78.81	4.53	95.217	0.000**

*** Statistically significant differences at .01 level*

The table showed that English writing ability of TNI students after problem-based learning was higher than before at .01 level. The mean scores of pretest were at 32.32 and mean scores of posttest were at 78.81. It demonstrated that teaching by using social network through problem based learning was able to enhance students' writing ability.

2. Results of English writing ability analyzing of TNI students which derived through task assessment in each learning plan in 6 times

Table 5: Mean scores of English writing ability of TNI Students from 1st-6th time

No.	Writing Task 1-6						total (300 scores)	($\bar{x}$) (50 scores)	(S.D.)
	1 (50 scores)	2 (50 scores)	3 (50 scores)	4 (50 scores)	5 (50 scores)	6 (50 scores)			
1	45	48	49	48	47	48	285	47.50	1.37
2	42	45	44	43	48	43	265	44.16	2.13
3	48	44	46	46	41	43	268	44.66	2.50
4	44	46	42	45	48	47	272	45.33	2.16
5	42	41	40	49	42	44	258	43.00	3.22
6	40	48	49	42	46	45	270	45.00	3.46
7	43	49	48	49	42	44	275	45.83	3.18
8	48	49	43	47	48	41	276	46.00	3.22
9	43	42	40	44	44	46	259	43.16	2.04
10	44	41	43	44	47	45	264	44.00	2.00
11	46	49	41	41	41	45	263	43.83	3.37
12	42	42	45	48	44	45	266	44.33	2.25
13	44	43	47	49	48	47	278	46.33	2.33
14	40	43	43	44	44	45	259	43.16	1.72
15	45	43	44	48	49	44	273	45.50	2.42
16	43	49	47	45	47	42	273	45.50	2.66
17	42	46	48	47	46	41	270	45.00	2.82
18	44	49	44	42	47	49	275	45.83	2.92
19	43	46	43	48	46	40	266	44.33	2.87
20	46	45	42	45	46	43	267	44.50	1.64
21	47	44	48	42	41	43	265	44.16	2.78
22	45	46	48	42	45	44	270	45.00	2.00
23	41	48	49	42	44	45	269	44.83	3.18
24	39	42	45	46	41	47	260	43.33	3.14
25	41	43	45	47	47	49	272	45.33	2.94
26	44	45	44	46	41	47	267	44.50	2.07
27	44	45	47	43	42	46	267	44.50	1.87
28	45	46	48	49	49	49	286	47.66	1.75
29	43	41	41	45	46	46	262	43.66	2.33
30	43	47	48	47	41	43	269	44.83	2.85
Total	**43.53**	**45.16**	**45.03**	**45.43**	**44.93**	**44.86**	**268.96**	**44.82**	**2.51**

The table showed that mean scores of English writing ability of TNI students in total were at 44.82 (S.D. =2.51). when considered in each task, it was found that the highest task was from 4th task at ($\bar{x}$ =45.43) , 2nd task at ($\bar{x}$ =45.16) and 3rd task at ($\bar{x}$ =45.03) . The lowest task was from 1st task at ($\bar{x}$ =43.53), 6th task at ($\bar{x}$ =44.86) and 5th task at ($\bar{x}$ =44.93) respectively.

Table 6: results of English writing ability analysis of TNI students which derived through writing task assessment in each lesson plan from 6 times converted to a total of 5 scores

Writing task	**1st**	**2nd**	**3rd**	**4th**	**5th**	**6th**	**Total**
	$\bar{x}$	$\bar{x}$	$\bar{x}$	$\bar{x}$	$\bar{x}$	$\bar{x}$	$\bar{x}$
	4.35	4.51	4.50	4.54	4.49	4.48	**4.48**
Level of English writing ability	good	Very good	good	Very good	good	good	good

Scores of each task assessment which were a total of 50 were converted to 5 rating scales in order to measure mean scores of the students' English writing ability based on following criteria (adapted from Thaweerat, 2000: 107-108)

4.51 - 5.00 refers to TNI students had English writing ability at very good level
3.51 - 4.50 refers to TNI students had English writing ability at good level
2.51 - 3.50 refers to TNI students had English writing ability at moderate level
1.51 - 2.50 refers to TNI students had English writing ability at low level
1.00 - 1.50 refers to TNI students had English writing ability at very low level

The table showed that an assessment of English writing ability of TNI students from 1st -6th writing task, it was found that English writing ability of TNI students was at good level ($\bar{x}$ =4.48). When considered in each aspect, it was found that 2nd writing task and 4th writing task was at very good level. For 1st writing task, 3rd writing task, 5th writing task, 6th writing task, it was at good level respectively.

3. Result of satisfaction with using social network through problem based learning to enhance English writing ability of TNI students after the course

Table 7: result of satisfaction of TNI students towards problem based learning method

Statement	**Level of satisfaction**	**meaning**
	x	
1. Students have opportunity to do activities by themselves.	4.55**	highest
2. Students review background knowledge about English and apply in teacher's assignments.	4.45	high
3. Students can remember vocabulary, idioms, and grammar in each unit because they can learn by doing.	4.51*	highest
4. Students practice listening, speaking, and reading skills especially writing skill from task activities of each unit.	4.25	high
5. Students can use English in explanation story very well.	4.40	high
6. Students exchange knowledge with different major friends and take information to apply in teachers' assignments.	3.90	high
7. Students study how to search information and desired learning sources and apply in their assignments.	4.30	high
8. Students have participation in sharing ideas and opinions among groups in order to plan assigned tasks effectively.	4.00	high
9. Students have freedom in planning their own tasks with participation of teachers.	4.40	high
10. Students want some helps from teachers when they need.	4.35	high
11. Students learn their mistakes from task activities and self-	4.30	high

assessment in learning log.		
12. Students have opportunities to meet teachers individually in order to know their scores of task-based learning and get some suggestions from teachers to improve their mistakes.	3.90	high
13. Contents that students study can apply in learning in higher education.	4.45	high
14. Activities in each unit support students to use critical thinking and language style analysis including concluding structures and language usage.	4.20	high
15. Activities of learning management in each class help students to understand contents of each unit very well.	3.80	high
16. Students can take stages of task-based learning to apply in other subjects.	4.10	high
17. Students are more pleasured and like to learn English.	4.35	high
18. Students can do assigned tasks without seriousness about errors and the blaming from teachers.	4.60**	highest
19. Students can use their creative thinking in presentation their own tasks.	4.20	high
20. Students are proud of their own tasks.	4.52*	highest
Total of mean scores	4.29	High

The table showed that mean scores of satisfaction with method of problem-based learning of TNI students in overall were at high level ($\bar{x}$ =4.29), when considered in each statement , it was found that the highest rank of satisfaction was from item *18 Students can do assigned tasks with seriousness about errors and the blaming from teachers* ($\bar{x}$ =4.60), item 1 *Students have opportunity to do activities by themselves*($\bar{x}$ =4.55), item 20 *Students are proud of their own tasks* ($\bar{x}$ =4.52), *and item* 3 *Students can remember vocabulary, idioms, and grammar in each unit because they can learn by doing* ($\bar{x}$ =4.51) respectively.

Conclusion

1. English writing ability of Thai-Nichi Institute of Technology students was at good level.

2. The students' writing achievement after the problem-based learning was significantly higher than before, with instruction constructed at 0.01 level.

3. The students' satisfaction towards problem-based learning activities was at high level ($\bar{x}$ =4.29).

Discussion

1. According to results of learning management of problem-based learning through social network to enhance English writing ability of Thai-Nichi Institute of Technology students, it was found out that English writing ability of Thai-Nichi Institute of Technology students was at good level. It might be because the students were taught with problem based learning which focused on solving problems in real life about their English writing which related to the idea of Sonmez and Lee (2003) who advocated that problem based learning has potential to arise curiosity in the learners. Furthermore, PBL is an instructional approach that challenges learners to seek solutions to real world problems by themselves or in groups, and PBL engages learners in developing skills as self-directed learners.

2. The students' writing achievement after the problem-based learning was significantly higher than before, with instruction constructed at 0.01 level. This might be because the samples gained knowledge of English writing through 6 writing tasks. In each

task, the students were required to brainstorm the content using mind mapping to plan for content organization, problem-solution, and comparison which related to the concept of Willis (1996) who indicates that there are various forms of writing tasks such as sequencing, matching, solving problem, comparison and sharing personal experiences. Moreover, sharing personal experiences are released for the students to their point of view and learn others' ideas.

On the other hand, Thai-Nichi Institute of Technology students aim on practicing English writing skill. Therefore, classroom activities are depended on level of the students' competence. If the task is too difficult, the students will give up on that task. In contrast, if the task is too easy, the students will be bored of doing that task. So in order to create the task that suits the students' needs and requirements, using social network though problem based learning can enhance English writing ability of students who involve in that assigned task (Stone, 1991).

3. The students had a high level of satisfaction through learning management by using problem-based method on English writing ability ($\bar{x}$ = 4.29). This might be because the students satisfied with English writing lessons and writing tasks emphasized problem based learning through social network created by the researcher. This is related to notion of Ross and Hurlbert (2004) who stipulated that PBL was more effective pedagogy than conventional lecture method for teaching English essay writing to higher education level students and for improving their English writing skill. Furthermore, PBL can be applied for teaching English writing skill of tertiary level students. Thus, the teachers, educational leaders and policy makers should arrange and facilitate for PBL's implementation, and the curriculum designers should include PBL as part of teachers' training programs.

Moreover, the TNI students satisfied with this method, it might be because teaching writing in English as a writing skill that may function as an essential gate leading students to a successful career in this information technology driven world (Warschauer, 2006). Facebook plays a crucial role of communication and social constructivism as they lead to active, authentic and enjoyable learning (Vygotsky, 1978). Therefore, TNI students preferred this teaching method at high level.

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A Study of English Writing Proficiency of Business and Technical Students in Tertiary Level

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Abstract

The purposes of this research were 1) to study English writing proficiency of business and technical students in tertiary level, 2) to business and technical students' English writing achievement before and after writing activities, and 3) to investigate business and technical students' satisfaction with this type of instruction.

The subjects were 40 business and technical students at Thai-Nichi Institute of Technology during second semester of 2016 academic year which derived through simple random sampling technique. The instruments used in this experiment were the pre-post English writing test, the writing lesson plans, the English writing ability evaluation form and the questionnaire on students' satisfaction towards writing learning.

The experimental process and data collection were conducted as follows: The subjects were given an English writing ability pretest. Then, the four lesson plans were used in second semester. After the completion of each lesson, the English writing ability evaluation form, and the satisfaction questionnaire were used for surveying the subjects' satisfaction with writing method. The data were statistically analyzed by mean scores, standard deviation, percentage and t-test for dependent samples.

The results were as follows;

1. English writing ability of business and technical students was at good level.
2. The students' writing achievement after learning was significantly higher than before, with instruction constructed at 0.01 level.
3. The students' satisfaction towards writing activities was at high level.

Keywords: *English Writing Proficiency, Business and Technical Students*

Introduction

Writing is an extreme important skill in the curriculum at any time of the learning or assessment period. In a research on student writing at university level, Fukao & Fujii (2001) stipulated that writing is very important in determining the success of mastering the curriculum since writing can demonstrate the extent of a student's learning progress. As for language instructors, a student's writing will assist to determine how much comprehension of the course content has occurred upon completion of a particular course.

In universities, students need to prepare and submit written assignments, critical reviews, term papers, essays, and theses as part of their academic assignments to fulfill their course requirements. Apart from the course requirements in learning institutions, Zamel (1998) advocates that writing has the ability to enhance learning in a particular discipline. Moreover, writing can help students to acquire content knowledge and in the course of analyzing, synthesizing, evaluating and making inferences, students are actually developing their cognitive skills.

Furthermore, Petric and Czárl (2003) advocated that there are three stages in writing involving pre-writing, while writing and post-writing. These three stages of the writing process are interconnected and they may overlap and may occur repeatedly without any fixed sequence or order. Hence, many theorists (Manchón and Roca de Larios, 2007; Cohen, 1998) stipulated that L2 students need to use various techniques and strategies as required at each

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stage of the writing process. In this respect, Petric and Czárl (2003) believed that the writing process as actions or behaviors intentionally carried out by writers using their own strategies to produce good writing.

In conclusion, researcher studied proficiency in English writing skill of business and technical students at Thai-Nichi Institute of Technology in second semester of 2016 academic year. The results derived from this research will provide guidelines for improvement and development of instruction for further course.

Research Purposes

1) To study English writing proficiency of business and technical students in tertiary level,

2) To business and technical students' English writing achievement before and after writing activities, and

3) To investigate business and technical students' satisfaction with this type of instruction

Research Deign

The data was gathered and analyzed as follows:

1. Population and Samples

1.1 The population is business and technical students at Thai-Nichi Institute of Technology in second semester of 2016 academic year. There were 1,200 students from Faculty of Business Administration and Faculty of Information Technology.

1.2 The samples consisted of 40 students derived from a simple random sampling technique.

Duration in Experiment

The experiment ran for 10 weeks (20 hours)

Contents used in this experiment

Contents used in this experiment consisted of 4 topics which derived through students needs as follows:

1. How has technology changed your life?
2. What is your dream job? Why?
3. How do Thai learners acquire a new language?
4. What is your bad experience? Why?

Variables

Variables in this study were as follows:

1. The English writing ability of business and technical students before and after the class.
2. The satisfaction of business and technical students towards English writing course.

Research Instruments

1. The pre-post English writing test
2. The four writing lesson plans
3. The English writing ability evaluation form
4. The satisfaction questionnaire

Data Analysis

The collected data was analyzed using computer program. The t-test was employed to compare the subjects' English writing achievement before and after English writing course.

The mean and standard deviations of scores from English writing evaluation form, the satisfaction questionnaire were used to measure at the end of the course.

Data Collection

The experimental process and data collection were conducted as follows: The subjects were given an English writing ability pretest. Then, the four lesson plans were used in second semester. After the completion of each lesson, the English writing ability evaluation form, and the satisfaction questionnaire were used for surveying the subjects' satisfaction with writing method. The data were statistically analyzed by mean scores, standard deviation, percentage and t-test for dependent samples.

Research Results

1. Results of English writing ability analyzing of business and technical students which derived through task assessment in each learning plan in 4 times

Table 1: Mean scores of English writing ability of TNI Students from 1st-4th time

	Writing Task 1-4						
No.	1 (50 scores)	2 (50 scores)	3 (50 scores)	4 (50 scores)	**total (200 scores)**	($\bar{x}$) (50 scores)	(S.D.)
1	43	47	48	47	**185**	46.25	2.21
2	43	45	42	43	**173**	43.25	1.25
3	40	43	43	44	**170**	42.5	1.73
4	43	48	49	43	**183**	45.75	3.20
5	43	45	42	43	**173**	43.25	1.25
6	43	44	49	43	**179**	44.75	2.87
7	49	46	47	49	**191**	47.75	1.50
8	48	49	41	48	**186**	46.50	3.69
9	43	45	44	41	**173**	43.25	1.70
10	44	47	44	48	**183**	45.75	2.06
11	46	42	45	49	**182**	45.50	2.88
12	42	42	43	43	**170**	42.50	0.57
13	44	43	43	49	**179**	44.75	2.87
14	40	43	43	44	**170**	42.50	1.73
15	45	43	40	48	**176**	44.00	3.36
16	43	49	43	45	**180**	45.00	2.82
17	42	46	44	47	**179**	44.75	2.21
18	44	49	44	42	**179**	44.75	2.98
19	43	46	43	48	**180**	45.00	2.44
20	46	45	42	45	**178**	44.50	1.73
21	47	44	48	42	**181**	45.25	2.75
22	45	46	49	42	**182**	45.50	2.88
23	41	48	44	42	**175**	43.75	3.09
24	39	42	46	46	**173**	43.25	3.40
25	41	43	42	47	**173**	43.25	2.62
26	44	45	40	46	**175**	43.75	2.62
27	44	45	49	43	**181**	45.25	2.62
28	45	46	48	49	**188**	47.00	1.82

29	43	41	41	45	**170**	42.50	1.91
30	43	47	48	47	**185**	46.25	2.21
31	43	45	42	43	**173**	43.25	1.25
32	40	43	43	44	**170**	42.50	1.73
33	43	48	49	43	**183**	45.75	3.20
34	43	45	42	43	**173**	43.25	1.25
35	43	44	49	43	**179**	44.75	2.87
36	49	46	47	49	**191**	47.75	1.50
37	46	41	44	46	**177**	44.25	2.36
38	49	48	44	49	**190**	47.50	2.38
39	46	49	41	46	**182**	45.50	3.31
40	43	45	42	43	**173**	43.25	1.25
Total	**43.77**	**45.20**	**44.42**	**45.17**	**7,143**	**44.65**	**2.30**
%	87.54	90.40	88.84	90.34	89.28	89.28	

The assessment of English writing ability of **business and technical students**, the researcher used English writing test in each unit which assessed continuously every unit of learning. Therefore, percentage of scores was calculated from criteria as following; (adapted from Thaweerat, 2000; Wongsothorn, 1995)

81-100 means very high
61-80 means high
41-60 means moderate
21-40 means low
1-20 means very low

The table showed that the unit test scores of business and technical students in the total were at 7,143 out of 8,000 scores which calculated to be percentage at 89.28% out of 100%. This meant that business and technical students had English writing ability at very high level. However, when considered in each unit, it was found that business and technical students got the highest scores from unit 2 (90.40%) and unit 4 (90.34%) respectively.

2. Results of analyze pretest and posttest scores of English writing ability test of business and technical students

The researcher used English writing ability test (2 items: 100 scores) to experiment students' ability both pretest and posttest after learning. Then pretest and posttest scores were compared as following table:

Table 2: Comparison of pretest and posttest mean scores in English writing ability of business and technical students

English writing ability scores	n	$\bar{x}$	S.D.	t	Sig.
Pretest	40	41.56	5.74	33.548	
Posttest	40	82.73	4.38	92.348	0.000**

** *Statistically significant differences at .01 level*

The table showed that English writing ability of business and technical students after the class was higher than before at .01 level. The mean scores of pretest were at 41.56 and mean scores of posttest were at 82.73. It demonstrated that teaching-learning about writing class was able to enhance students' writing ability.

3. Result of satisfaction with teaching English writing of business and technical students **after the course**

Table 7: result of satisfaction of business and technical students after the course

Statement	**Level of satisfaction**		**meaning**
	$\bar{x}$	S.D.	
1. Students can remember vocabulary, idioms, and grammar in each unit because they can learn by doing.	4.28	0.72	high
2. Students can practice writing skill from task activities of each unit.	4.59*	0.86	highest
3. Students exchange knowledge with different major friends and take information to apply in teachers' assignments.	4.48	0.92	high
4. Students study how to search information and desired learning sources and apply in their assignments.	4.41	0.63	high
5. Students have participation in sharing ideas and opinions among groups in order to plan assigned tasks effectively.	4.43	0.77	high
6. Students have freedom in planning their own tasks with participation of teachers.	4.53	0.72	highest
7. Students learn their mistakes from task activities and self-assessment in learning log.	4.31	0.73	high
8. Contents that students study can apply in learning in higher education.	4.58*	0.81	highest
9. Activities in each unit support students to use critical thinking and language style analysis including concluding structures and language usage.	4.47	0.69	high
10. Students can do assigned tasks without seriousness about errors and the blaming from teachers.	4.52	0.72	highest
Total of mean scores	**4.46**	**0.76**	**High**

The table showed that mean scores of satisfaction towards English writing teaching of business and technical students in overall were at high level ($\bar{x}$ =4.46), when considered in each statement , it was found that the highest rank of satisfaction was from item 2 *students can practice writing skill from task activities of each unit* ($\bar{x}$ =4.59) and item 8 *Contents that students study can apply in learning in higher education* ($\bar{x}$ =4.58), item *6. Students have freedom in planning their own tasks with participation of teachers* ($\bar{x}$ =4.53), *and item* 10 *Students can do assigned tasks without seriousness about errors and the blaming from teachers* ($\bar{x}$ =4.52) respectively.

Conclusion

1. English writing ability of business and technical students was at good level.
2. The students' writing achievement after learning was significantly higher than before, with instruction constructed at 0.01 level.
3. The students' satisfaction towards writing activities was at high level.

Discussion

1. According to results of English writing ability of business and technical students was at good level. It might be because the students understood how to write in target language and focused on sets of language elementary such as grammar vocabulary and communication skills which related to the notion of Cummins (1980) who advocated that proficiency is an individual's general level of ability to understand and write in the target language while remaining conscious of the relations and combination of numerous sets of language elements such as grammar, vocabulary and sociolinguistic and communicative skills with the objective of achieving accurate communication.

2. The students' writing achievement after the course was significantly higher than before, with instruction constructed at 0.01 level. This might be because the samples used three stages in writing involving pre-writing, while-writing and post-writing. These three stages of the writing process are interconnected and they used various techniques and strategies as required at each stage of the writing process (Cohen, 1998).

3. The students had a high level of satisfaction towards English writing ability instruction. This might be because the students satisfied with English writing lessons and writing tasks which focused on writing activities, proficiency and communication in writing English which related to the idea of Lea and Strierer (2000) who stipulated that Proficiency in language is assumed as a key to successful communication. Moreover, language will successfully assist people in diverse activities, which involve communication, various types of dealings, or even writing. Therefore, TNI students preferred this teaching method at high level.

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Future Vision of Educational Innovation and Technology for ASEAN Community

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ABSTRACT

This research aimed to study the factors of success influencing the development of educational innovation and technology for ASEAN Community, and examine the future vision of educational innovation and technology for ASEAN Community. Mix method was applied to study the relevant researches and literature review, synthesized all information to create the research framework. Quantitative research method was applied to 400 educational executives and staff in educational institutions. Qualitative research method with focus groups was used. Data was collected from 15 experts selected with purposive sampling based on the required qualification.

Findings concluded that the factors of success of educational development for ASEAN Community in the future required the integrated teaching and learning model with educational technology innovation using social media. It was the new teaching approach that was consistent with the goal to achieve the desirable characteristics efficiently and effectively for the highest benefits of the higher educational institution, society and nation.

Key words: Educational innovation and technology, ASEAN Community, Future Vision

INTRODUCTION

Association of South East Asian Nations or ASEAN comprises of ten countries: Malaysia, Indonesia, Philippines, Singapore, Thailand, Brunei, Myanmar, Laos, Vietnam, and Cambodia (Department of Asean Affairs, Ministry of Foreign Affairs, 2017: 2). The integration is a key factor to strengthen the insight strength amongst the member countries widely, which finally results in the development of livelihood of people and the prosperity of the region and the solution for poverty to minimize the social inequality. It will also be the market and the production basement of products, services, investment, funds, and skilled labors transfer freely. The region will have high competitiveness with the equal economic development and integration to the world economy completely. In order to become successful, all member countries need to give precedence to education (ASEAN Economic Community, 2017) as it affects the country development in terms of progressive and strength economy.

Therefore, in The 12th ASEAN Summit, the ASEAN leaders autographed in "Cebu Declaration" that determined the educational strategy for all the countries to build the

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awareness of stepping to be ASEAN Economic Community or AEC. There was a teacher and student exchange program for each level, the forming of cooperation by using English language as a mean, the promotion on educational technology, the preservation on the local wisdom, connection of culture of all countries, creation of excellence to the individual of associated countries in ASEAN, the exchange of aid to develop the competency of ASEAN to be able to compete with the world community.

Development of education for ASEAN in the future for the sustainable and secure progress efficiently (Ministry of Education, 2017) requires the diverse advance educational technology boundlessly that is able to store load of data in multimedia form (Odhiambo, 2012) . As a result, it is applied to digital media learning management through electronic media, which is the new educational approach or innovation that is the tools for educational management such as the instructional model using internet, social online or Mobile learning. It is the learning management model that contains the lesson from books, textbooks, articles, and other sources of knowledge in electronic media form that promotes ASEAN to gain required knowledge and skills in the future (Kaplan and Haenlein, 2009: 33).

Integrated learning for ASEAN that requires various types of media, both technology and instructional activities to create the appropriate leaning model integrated to the new media such as video, audio, and motive picture to the traditional presentation in order to make it more interesting and simple to understand. It is the online learning system that is a self-learning through internet which everyone can learn anything at any time from any places, and responds to the individual learning at the interest to form the value of individual or group of people bases on knowledge, capability, and competency leading to the success. Further, there is the integration of course content to connect to each other accordingly. It does not have the main content or course, but is integrated to lifelong learning system aiming to create the new different learning alternative for the individual. However, the common thing is to create the physical, mental, emotional, social, and intellectual perfection creatively (Theera Runjaroen, 2012). To enhance knowledge and potential of ASEAN people to become efficient the key strategy is the use of practical method to receive information, data, and knowledge in various forms quickly and appropriately to knowledge and capability promotion truly by learning efficiently and effectively to achieve the educational goal for ASEAM people.

Educational management for ASEAN requires the advance educational communication innovation and technology as the tool for activities through online electronic communication using application that provides the direct benefits for efficient teaching and learning. Digital system provides equipment that people can access to create the desirable skills via 3G-4G technology. It is the international strategy involves the diversity of learning management process, content, and lesson management to connect to the educational communication network that is growing at 200% while the producers develop supportive program at 1,000%, which implies the rapid growth (Loffler, Krockel, & Hettich, 2011: 658).

From all mentioned above on the importance of the future vision of educational innovation and technology for ASEAN, it shall become the significant factor of academic, economic, social, and political advancement, as well as the part of ASEAN prosperity.

OBJECTIVES

The objectives of this research are:

1. To study the factors of success affecting the development of educational innovation and technology for ASEAN.
2. To examine the future vision of educational innovation and technology for ASEAN.

FRAMEWORK

From the relevant concepts, theories, and researches, the researcher created the framework of future vision of educational innovation and technology for ASEAN that consisted of the following components.

1. Factor of organizational change
2. Factor of technology management
3. Factor of educational innovation and technology
4. Factor of future vision of educational innovation and technology for ASEAN

Therefore, all above factors were the framework as shown in Figure 1.

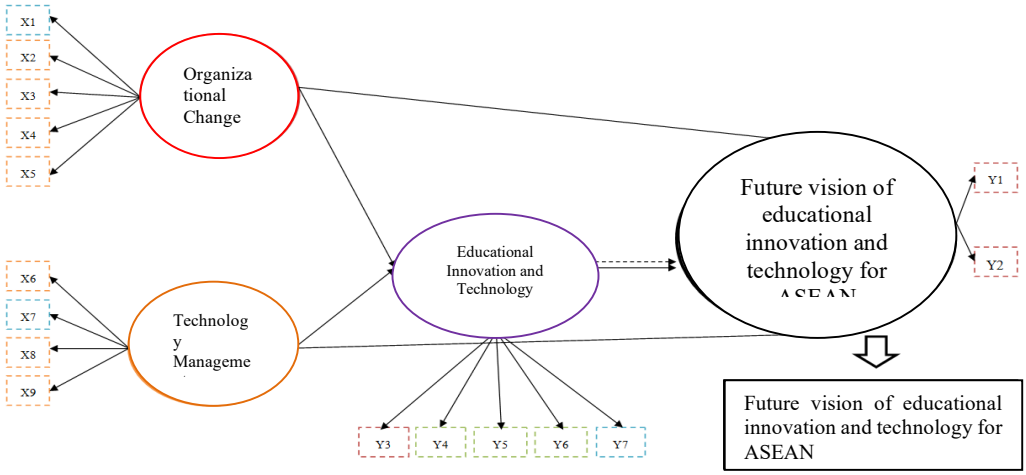

Figure 1 Research framework

RESEARCH METHODOLOGY

Mixed method was used in this research from researching documents, reviewing relevant literatures, and synthesizing to create framework. Quantitative and qualitative method were used with focus group to examine and evaluate the future vision. It was the technique referring to the expert to brainstorm the opinion and suggestion, as well as the appropriateness and feasibility of future vision whether it would happen or not to the practice to gain knowledge, fact, and findings that answered the research objectives. The details were as follows.

1. Quantitative research

1.1 Population was the executives and staff in the higher educational institutions. Sample group was 400 executives and staff in the higher educational institutions selecting from the infinite population. Thus, the formula for calculating the infinite population sample group was appropriate to apply with the confidence level at 95% and the error 5% at the

maximum (Suchart Prasitrattasin, Kannikar Sukkasem, Sophit Phongseree, and Thanomrat Prasitthimet, 2008). Simple random sampling was applied to select the number sample as required.

1.2 Tool for data collection was the 5-scale questionnaire on the opinion on the significance level of factors relating to future vision of educational innovation and technology for ASEAN and tested the reliability to validate the construct validity of the created tool.

1.3 The researcher collected data for analysis by coordinating with the sample group to make appointment and distribute the questionnaire via post to 400 participants.

1.4 Validated tool quality by testing the validity and reliability of the questionnaire for revision for more appropriateness and clearness which were 1) verified the quality of content validity by giving to five experts to find the Index of Item-Objective Congruence (IOC), and (2) tested the validity or the consistency with the Cronbach's Apha Coefficient. Test result showed that the result of all sections was .70 which proved the reliability.

1.5 Statistics used to analyze data were percentage, frequency distribution, and significance level of factors related to future vision of educational innovation and technology for ASEAN by finding the mean and standard deviation with statistical significance at 0.05 level.

2. Qualitative research

The researcher applied focus group to the group of experts comprised with 6 experts in education and 9 experts in educational innovation and technology of the ASEAN member countries by contacting the embassy of the9 member countries for the participation. Therefore, there were 15 experts involved. Conversation was recorded and noted. The data was analyzed and interpreted with content analysis. The research result was classified into the aspect followed the process of 1) setting the scope of the situation of future vision of educational innovation and technology for ASEAN to cover the 10 years ahead, 2) brainstorming by the experts and summarizing the aspect beforehand, 3) identifying the possibility of force towards social, technology, economic, environmental and political aspect that might completely change the situation or the ongoing trend, and 4) connecting and applying the situation as the background of the tentative future and applying the focus group result as the important information to summarize the research.

ANALYSIS RESULT AND CONCLUSION

In order to find the knowledge to answer the research objective to study the factor of success affecting the development on educational innovation and technology for ASEAN and the future vision of educational innovation and technology for ASEAN, the researcher began with the analysis result of statistic data relating to the factor of success affecting the development on educational innovation and technology for ASEAN by finding the mean and standard deviation using for measure the significance level of each factor relevant to the future vision of educational innovation and technology for ASEAN, as shown in Table 1.

Table 1 Mean and standard deviation, factors as overall

No.		Mean	Standard Deviation	Rank
1	Organizational change	3.91	.756	2
2	Technology management	3.83	.634	4
3	Educational innovation and technology	3.99	.667	1
4	Future vision of educational innovation and technology for ASEAN	3.85	.643	3

From Table 1, mean and standard deviation of factors in overall could be ranked by the significance as follows.

1st rank - mean of educational innovation and technology was 3.99. In the future, ASEAN had to arrange the processed information, news, knowledge, fact, material or resources into a form of electronic information and apply educational technology such as the modern technology or innovative media in teaching and learning to integrate the change in various forms of teaching and learning, both two-way distance learning or satellite learning. It would help to enhance knowledge, experience, and connect the relation systematically to create the knowledge and application, support and promote the supply, production, and development of innovation using technology media in learning management resulted from the need analysis in sufficient teaching and learning management to enhance the natural development based on the competency of people in ASEAN through internet network.

2nd rank - mean of organizational change was 3.91. In the future, ASEAN needed to adjust organizational structure, mission, and organizational culture of educational institution of all member countries to support the educational connection and to create dynamic and diversity in terms of objective and purpose of educational innovation and technology management emphasizing on being the regional center to build the educational excellence of ASEAN in international level.

3rd rank - mean of future vision of educational innovation and technology for ASEAN was 3.85. In the next ten years, ASEAN should have the purpose at the use of internet as a mean to connect educational network in learning to relate systematically with teaching and learning factors using technology to develop cooperative network concerning educational innovation and technology in national level according to the standard. Therefore, everyone would have intellectual capital and connect to each other, which would help them to achieve the goal effectively, continuously, and sustainably by self-learning with up-to-date content and appropriate content to ASEAN and matched their interest. People could apply knowledge in practical effectively and efficiently from the cooperation on educational technology of all countries by adhering to the benefits of the member countries as a priority.

4th rank - mean of technology management was 3.83. In the future, ASEAN should promote the use of tool or modern innovation and technology in educational management of all aspects that was the key of educational development. The policy and the clear announcement for ASEAN was required. Strategic planning for international technology management should be set as it was the approach to create the efficiency. The assignment to the responsible person who was knowledgeable, skillful, and capable was needed. It required the diverse teaching and learning model to promote self-learning based on the desire of user,

convenience, and the simple accessibility that could be changed or adjusted as appropriated. Technology was used to design the learning model and experience focusing on ASEAN people which was diverse and flexible to respond to the need.

The analysis result and findings of quantitative research by focus group with the experts showed the summary of future vision of educational innovation and technology for ASEAN to achieve the integration plan of ASEAN. Thus, to connect the education integrated learning model should be developed through educational innovation and technology using integrated online media that consisted of the following components.

1 . Member countries should establish the central educational institution to be in charge of this matter directly. All countries took part in the operation to become successful in connecting education so all could learn and develop self-potential. The organization should have management in operational and financial policy, as well as other policies.

2. Content, learning content, curriculum, exercise, test, and multimedia files should be prepared. Lesson creation system comprised of tool for content forming. The system was well applied to the Text-based lesson and Streaming media lesson, visual and video presentation and audio file download by focusing on the learning arrangement at the real time and creating the learning environment. It consisted of ASEAN story, traditions and culture, and the useful stories for ASEAN people to study the integrated learning with educational innovation technology using various types of online media that could be accessed from anywhere at any time. Further, the system was able to support unlimited numbers of ASEAN people and lesson.

3. Learning support system comprised of the equipment to use educational technology that was able to connect to the learning management program. They were the equipment that used for communicate among ASEAN people and the instructors, and among ASEAN people themselves.

In regard to the government agencies of each country, they should set the policy to promote educational innovation and technology for ASEAN so ASEAN people were able to learn through computer network or mobile devices conveniently. Various teaching approaches in the time of telecommunication advancement that connected worldwide allowed benefits for ASEAN people to have self-learning efficiently. Integrated learning model with educational innovation and technology was active since it could be connected via online network efficiently all the time from everywhere. It would become the key educational channel in the future that did not require high cost but provided sustainable growth for self, society, and nation efficiently.

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The Impact of a Classroom Intervention on University Students' Learning in a Mathematics- and Statistics-related Subject

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Abstract

A growing number of underprepared students are entering higher education institutions and students' underachievement in mathematics is indeed of great concern. Numerous research studies have pointed out that the academic domain of underpreparedness among such students entails a lack of mathematical ability and effective study skills. Research also point out that education should focus on "learning how to learn" and that educators in South Africa should turn back to their primary responsibility, which is to teach learners necessary thinking skills. This study reports on the introduction of a classroom learning strategy that was designed to improve students' academic performance in a mathematics and statistics-related subject at the Central University of Technology, Free State. The study followed a non-equivalent pre-test post-test design involving an experimental group and control group of students. A quasi-experimental approach was used to determine whether the post-test performance of students who were exposed to the classroom learning strategy (experimental group) was higher than that of students who received no classroom learning strategy (control group) in the module *Business Statistics/Statistics II*. With regard to the qualitative mode of study, the researcher conducted a nominal group setting to determine the developmental experiences students found most useful after the implementation of the classroom learning strategy intervention. The quantitative analysis of students' post-test performance showed increases in students' academic performance in the module *Business Statistics/Statistics II*. The results that emerged from the nominal group technique setting also support the effectiveness of the researcher's proposed classroom learning strategy intervention, as it had a positive effect on students' attitudes regarding a mathematics and statistics-related subject.

Keywords: *underprepared students, mathematical ability, effective study skills, classroom learning strategy intervention*

1. INTRODUCTION

This article is concerned with university students' underachievement in a mathematics and statistics-related subject. The researcher attempted to develop a classroom learning strategy, aimed at improving students' academic performance in a mathematics and statistics-related subject at the Central University of Technology (CUT), Free State. The primary purpose of the research was to determine if the use of a classroom learning strategy intervention could positively affect students' academic performance and learning approaches in a mathematics and statistics-related subject.

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2. LITERATURE REVIEW

The persistent problem of poor academic performance of many students at primary, secondary and tertiary level, particularly in mathematics, is disturbing. Underachievement is often highlighted as the single most significant impediment to mathematics failure in developing countries, including South-Africa [Moore (in Brussouw 2007:139; Mukadam (2009:4 of 5)]. For more than two decades now, concerns have been voiced about the profile of the school-leaving learner applying to enter universities in South-Africa, with an increasing number of students in the educational system who experience serious and persistent problems in interpreting and performing academic tasks. Steyn and De Boer (1998:125) purport that one of the outstanding features of underprepared students, is their inadequate schooling in mathematics and natural sciences. Given this situation, underachieving students in mathematics are in dire need of a repertoire of learning approaches, strategies and methods to cope with the demands of tertiary education (De Boer and van Rensburg 1997:160). As a result, considerable emphasis is placed on the contribution leaders and practitioners can make towards relieving the high levels of failure in mathematics.

According to Yusof and Tall (1999:67), the traditional methods of teaching mathematics at university often seem to lead students into a 'deficit mode' of rote-learning material to pass examinations. As a result, these procedural forms of thinking and working often prove to be resistant to change [Sierpinska, Schoenfeld and Williams (in Yusof & Tall 1999:67)]. Students learn the "product of mathematical thought" rather than the process of mathematical thinking [Skemp (in Yusof & Tall 1999:67)]. In agreement with Yusof and Tall (1999:67), Steyn and De Boer (1998:127) argue that one of the obstacles that the underprepared student must overcome is a surface approach to learning, which is associated with rote-learning. However, "[w]hen students feel a need to engage the task appropriately and meaningfully, they follow a deep approach to learning" (Biggs and Tang 2007:24).

According to Raab and Adam (2005:93), underprepared and first generation students often lack effective study skills. To address this concern, Cukras (2006:194) suggests that study skill courses as well as academic assistance programs should be designed. According to Abrams and Jernigan (in Potgieter & Webb 2004:313), the responsibility lies with higher education institutions to provide effective intervention strategies to help with the retention of underprepared students. Leaders in higher education today need to understand the shift in knowledge structures and the changing framework of learning and teaching, especially with the transformational change in South African society. These changes from the traditional to the new paradigm in higher education are crucial in developing countries such as those in South Africa to solve long-standing underachievement and consequent failure rates in mathematics. However, professionals and practitioners in the academic arena often find it hard to make these changes effectively and efficiently, because they often lack the "know-how".

Given the importance of and emphasis on study skills in mathematics in the academic arena, this is a cause for concern. According to Mr Japie Gouws, executive director of the ATKV (Die Volksblad 2009d:10), study skill development has often in the past not focused enough on the development of effective study skills in mathematics.

The research on which this article is based, attempts to provide a possible solution for filling this gap and to make available to novice and experienced lecturers a 'tool' which may contribute to students' learning in a mathematics and statistics-related subject. This article reports on research conducted to investigate the implementation of a classroom learning strategy intervention for a mathematics and statistics-related subject at the CUT. The main purpose of this pilot study was to determine whether the use of a classroom learning strategy intervention could positively affect first-year students' academic performance as well as students' learning approaches in the module *Business Calculations* at the CUT.

3. RESEARCH DESIGN

This study is located within a quantitative paradigm, with some enhancement by means of qualitative observations of student's problem-solving approaches. In the qualitative mode of the study the researcher collected information with regard to students' problem-solving approaches and techniques by means of a reflection diary.

An experimental, quantitative approach was used when attempting to answer the question whether the test scores of students who have been exposed to the learning strategy intervention were any different to those of students who received only traditional instruction, with no intervention of the learning strategy.

A group of first-year students at the CUT was selected for the pilot study of the research project. A sample of 139 first-year students were selected from the total population (N=177) of students who were enrolled for the National Higher Certificates in Financial Information Systems, and Accountancy, at the CUT. The students from both courses formed part of two intact classes of students who took *Business Calculations* (BCL11AB) as a compulsory module. The students were all registered as full-time students on campus and attended BCL11AB classes three times per week over a period of six months during the first semester of the 2009 academic year.

A non-probability sampling method was employed, as the researcher did not make use of a random selection of participants. The researcher used convenience sampling, and more specifically wholeframe sampling, as the subjects were available and formed part of the lecturer's (who is also the researcher) classes (McMillan & Schumacher 2006:125).

The study followed a non-equivalent pre-test post-test control group design involving an experimental group and a control group (Leedy & Ormrod 2001:236; McMillan & Schumacher 2006:273). The students (n=50) who were enrolled for the National Higher Certificate in Financial Information Systems served as the experimental group and were taught following the proposed classroom learning strategy intervention. The students (n=89) who were enrolled for the National Higher Certificate in Accountancy served as the control group and received traditional instruction. Both groups of students attended two theory lectures twice a week and one tutorial once a week. The duration of each theory and tutorial lecture was 80 minutes. During the theory lectures, the lecturer explained the work to students and, during the tutorials, the students worked out exercises from the prescribed textbook. The researcher utilised the national prescribed syllabus for the module *Business Calculations* and strictly kept to the study guide. Both classes received exactly the same academic instruction (with different approaches) by the same lecturer, covered the same work content, and used the same prescribed textbook.

A quasi-experimental approach was therefore used in answering the question whether the *Business Calculations* test and exam results, as well as learning approaches of students who had been exposed to the proposed learning strategy intervention, were any different from those of students who were not exposed to the learning strategy intervention.

In an effort to investigate the research problem, the study has tested the following research hypotheses:

The first research hypothesis read as follows:

H_{01} : The post-test score in *Business Calculations* of the experimental group is equal to the post-test score of the control group.

H_{a1} : The post-test score in *Business Calculations* of the experimental group is significantly higher than the post-test score of the control group.

The second research hypothesis read as follows:

H_{02} : The mean difference score on the revised two-factor study process questionnaire (R-SPQ-2F) for the experimental group is equal to the mean difference score of the control group.

H_{a2} : The mean difference score on the revised two-factor study process questionnaire (R-SPQ-2F) for the experimental group is greater than the mean difference score of the control group.

For the purpose of this study, the researcher relied on numerical data (scores obtained from tests and the exam, as well as the R-SPQ-2F Questionnaire) to test the relationship between the variables as well as to test the formulated research hypotheses, i.e. whether the average post-test score in *Business Calculations* of the experimental group is higher than the average post-test score of the control group; and secondly, whether the mean difference score on the R-SPQ-2F Questionnaire for the experimental group is greater than the mean difference score of the control group. The results (scores) of the tests and exam were used in the study to assess the pre- and post-test performances of students in the module *Business Calculations*. The average post-test score was calculated by computing the average of the first post-test (post-test 1) and the second post-test (post-test 2). All results were compared to determine the effect the classroom learning strategy intervention had on the participants.

As this research involved the systematic collection of observable and measurable data as well as the statistical analysis of the data, the quantitative paradigm was considered appropriate for this study. In order to determine the effect of the proposed classroom learning strategy intervention on students' academic performance in the module *Business Calculations*, the quantitative data was collected by means of three self-developed instruments (two tests and one exam) intended to yield highly reliable and valid scores. The researcher also used the R-SPQ-2F Questionnaire by Biggs, Kember & Leung (2001:133) to gauge students' approaches to learning.

The quantitative data from students' scores in the pre-test and both post-tests were obtained by the researcher during the first semester of 2009 and entered into a database in which the results were analysed. Students were assessed during February, April and in the exam in May. The first class test of the BCL11AB semester subject served as the pre-test and was

administered to the participants in both groups in February before the learning strategy intervention. A first semester test paper comprising 25 multiple-choice items was used in this study and served as the pre-test. The majority of items were obtained from the prescribed textbook that students had to work from, with only one or two items from other literature sources. The test focussed on students' conceptual knowledge and each of the 25 questions represented a certain cognitive characteristic of important concepts in the module *Business Calculations*. Each question had five options that students could choose from, while the distracters in the multiple-choice test instrument were based on the mistakes students used to make as identified from the researcher's qualitative observations during tutorials. The students were assessed on the following concepts:

- Basic mathematical concepts, which include whole numbers, fractions, decimals, exponents, scientific notation and logarithms.
- Financial calculations, which include percentages, commission, discounts, profit and loss, and stamp duty.
- Algebra, which includes algebraic terms, algebraic expressions, simple linear equations, simultaneous linear equations, and business problems using simple algebra.
- Ratios and proportions, which include profit ratios, efficiency ratios and liquidity ratios.

The learning strategy intervention was implemented with the experimental group of students after the first test and continued for a period of six weeks. The control group, however, received traditional instruction. During these six weeks, the researcher encouraged students in the experimental group to follow the proposed learning strategy and exposed them to good study habits. After each lesson, the researcher summarised the work by means of a concept map, and taught students how to study that specific content area from the prescribed textbook.

The students were assessed for a second time in the main test (first post-test) which was administered to the participants in both groups during April, i.e. after six weeks of implementing the classroom learning strategy intervention. The majority of items in the test were obtained from the prescribed textbook with a few items from other literature sources. The post-test covered three chapters and comprised 25 multiple-choice questions regarding the following:

- Simple interest
- Compound interest
- Annuities

The researcher continued with the intervention for another three weeks with the experimental group of students, after which all students were assessed for the third and final time during the exam (second post-test), which took place at the end of May 2009. The exam semester paper comprising 25 multiple-choice test items, served as the second post-test. As the time-interval between the pre-test and post-test during which the intervention took place was relatively short (three weeks), the researcher used the exam results as a second post-test. The exam paper covered the whole syllabus and comprised the content of ten chapters from the prescribed textbook. The students were assessed on the same concepts mentioned above with regard to the pre-test and the first post-test, as well as on the following new concepts:

- Visual presentation of data

- Measures of central tendency
- Measures of dispersion

All students were assessed on the same day, in the same venue, at the same time with regard to the pre-test as well as both post-tests. The researcher developed all the tests as well as the exam paper, which were moderated and based on the curriculum activities of the module *Business Calculations* for the semester. The researcher also gave instructions to all the students in English and marked all answer sheets herself.

Content validity in this study was established by including only selected questions that are significant in a specific content domain from the prescribed textbook. The items in both tests and exam fairly represented the content domain that students were assessed on. Content validity for the items in both tests and exam were strengthened by asking another lecturer and also a statistician to review the items for clarity and completeness in covering most assessment and grading practices used (Bell 2005: 118; Salkind 2003:116). Internal validity is the extent to which differences in the dependent variable are accounted for by differences in the independent variable and not by any extraneous or third variables (Maas 1998:24; Kerlinger 1986:300). The extraneous variables were controlled in the research design through statistical measurement by building them into the design.

In order to gauge students' approaches to learning, the researcher administered the R-SPQ-2F Questionnaire to students before and after the learning strategy intervention. This instrument was developed by Biggs, Kember and Leung, and is used to assess deep and surface approaches to learning (Biggs, Kember & Leung 2001:133). The R-SPQ-2F Questionnaire comprises 20 Likert-type scale test-items which test deep and surface approaches to learning (see Appendix D). Each of these scales consists of 10 items, while the deep and surface motive and strategy scales consist of 5 items each. The items in the questionnaire requested the students to react to the statements by choosing one of five options, which ranged from "this item is never or only rarely true of me" (scored 1); through "this item is sometimes true of me" (scored 2); "this item is true of me about half the time" (scored 3); "this item is frequently true of me" (scored 4); to "this item is always or almost always true of me" (scored 5). According to Biggs, Kember and Leung (2001:145), the R-SPQ-2F Questionnaire is an ideal tool for teachers to use in evaluating and researching their own classes' learning approaches. The R-SPQ-2F Questionnaire has acceptable Cronbach alpha values for scale reliability and both deep and surface approach scales have well identified motive and strategy subscales [Biggs, Kember & Leung (2001:133)].

In the beginning of February 2009, the researcher administered the R-SPQ-2F Questionnaire to students during a theory class in the module *Business Calculations*. Participation in the questionnaire was voluntary and the responses were kept confidential. A total of 57 completed questionnaires were collected at the first and second testing, representing approximately 41% of the population of BCL students. The students also completed the same questionnaire during May, after the learning strategy intervention. The results were later statistically analysed to determine if there were any differences regarding students' approaches to learning.

4. DATA ANALYSIS AND RESULTS

For the purpose of this study, the independent variable was defined as the classroom learning strategy intervention. The particular learning strategy intervention is defined as the facilitation of a particular learning strategy which is derived from a constructivist perspective, with emphasis on the construction of mathematical knowledge and the processes by which learners create mathematical meaning (Biggs 1972:230). The first aim of the classroom learning strategy intervention was to improve students' academic performance in a mathematics and statistics-related subject. The second aim of the classroom learning strategy intervention was to motivate students to follow a deep approach to learning.

For the purpose of this study, the first dependent variable was represented by the average of the post-test scores of students' performance in a first-year mathematics and statistics-related subject, namely *Business Calculations*. Students' performance was measured by means of tests and exam scores in the module *Business Calculations*. As one of the questions of interest was whether the average post-test score is greater for the treatment group than it was for the control group, the researcher defined the average post-test score as follows:

$$Average = \frac{\sum (P_1 + P_2)}{2} \quad \text{where } P_1 = \text{Post-test 1 and } P_2 = \text{Post-test 2}$$

The second dependent variable was represented by the mean difference scores from the responses obtained from the R-SPQ-2F Questionnaire, which assessed students' approaches to learning. Students were assessed twice on this questionnaire, namely before the learning strategy intervention and thereafter. The difference between the pre-test and post-test with regard to this questionnaire was calculated for each student in the module *Business Calculations*.

Possible extraneous variables that might have compromised the results of this study were race, gender, age, "FTE status" and previous mathematical background. "FTE" refers to whether the student was entering the CUT for the first time (F), whether the student was transferred (T) from another HEI, or entering (E) from another programme in the same HEI. Therefore, a student who enrolled the previous year or changed courses, was considered a *not* "first-time entering" (N) student. A not "first-time entering" student may also refer to a student who has enrolled at the CUT previously, but is continuing after some years with the same course at the CUT. The extraneous variables were acquired by means of collecting biographical data from the CUT's data system. These variables were built into the design by measuring them and by analysing their influence on the dependent variables (McMillan & Schumacher 2006:118). In this research, the first dependent variable was the average post-test score of students' performance in the module *Business Calculations*. The second dependent variable was the difference score of the responses obtained from the R-SPQ-2F Questionnaire.

For the purpose of processing the data obtained, the statistical software package SAS was used. Initially, descriptive statistics were used to help explain and allow reflection on the performances of the two groups of participants. Descriptive, quantitative biographical data (race, gender, age and previous mathematical background) of the participants were obtained from the CUT Student Records Database at the beginning of the 2009 academic year. The researcher entered this biographical data on a database for data analysis purposes.

To test for any relationships and differences in each variable with regard to students' demographic profiles (gender, age, FTE status and mathematical background) between the two groups of students, the researcher made use of univariate analysis. The average of the two post-test results in *Business Calculations* was set as the dependent variable. The dependent variable was analysed using one-way ANOVA fitting; one variable at a time; the independent variable (Group), and each of the confounding variables.

Regression analysis was also used in order to determine whether students' average post-test performance was in any way related to students' age. To ascertain whether there are statistically significant correlations between the average post-test score in the module *Business Calculations* and students' age, the Pearson product-moment correlation coefficients were calculated and the significance thereof ascertained. According to Lind, Marchal and Mason (2002:460), "the coefficient of correlation describes the strength of the relationship between two sets of interval-scaled variables".

Multivariate analysis was also used in which the dependent variable (*Business Calculations* results: average of post-test results) was analysed using analysis of covariance. The analysis of covariance model contained the independent variable (Group) and all potential confounders (gender, age, race, previous mathematical background, FTE status, and *Business Calculations* results: pre-test). F-statistics and associated *P*-values were calculated for each variable in the model.

FINDINGS

Based on the quantitative as well as the qualitative results of the study, the following conclusions can be drawn:

1. The first research question of the pilot study was:

Does the implementation of a classroom study strategy intervention positively affect students' academic performance in the subject Business Calculations?

The pre-test results showed average results for both groups of students. The pre-test comprised much revision from work that had been covered in school. However, the first post-test results showed marked decreases in scores for both groups of students, with only a few students in both groups showing an increase in marks. This might be ascribed to the fact that the first post-test covered concepts that were new to students and which they were not familiar with. Although the results of the second post-test showed marked improvements for both groups of students, the researcher cannot claim that the improvement of scores resulted specifically from the proposed learning strategy intervention. The first research hypothesis is therefore rejected, meaning that the post-test score in *Business Calculations* of the experimental group was not significantly higher that the post-test score of the control group.

Students in the experimental group were classmates with students in the control group and saw these students on a regular basis at other lectures (McMillan and Schumacher 2006:140). Many of these students were accommodated in the same hostels on campus and formed their own study groups. Although students in the experimental group did not know that they were part of an experiment, and were not aware that the study "hints" or notes they received during classes were actually part of a particular learning strategy intervention, some students could still have exchanged notes with some of their friends in the control group. There could also have been other contributing factors, such as increased exposure to mathematics discourse

during the semester, or students taking examinations more seriously and therefore studying harder.

The results of the one-way ANOVA further confirm that students' performance in the post-test (average between post-test 1 and post-test 2) was independent of each of the confounding variables, namely: group membership, gender, mathematical background and FTE status. The results of the one-way ANCOVA also confirm no significance between students' post-test performance and each of the covariates. The significance, however, was very high between students' pre-test performance and post-test performance in the module *Business Calculations* as measured in this pilot study. In other words, students who performed poorly in the pre-test tended to perform poorly in the post-test as well, while students who performed well in the pre-test, tended to perform well again in the post-test.

2. The second research question of the pilot study was:

Does the implementation of a classroom study strategy intervention positively affect students' approaches to learning in the module Business Calculations?

As the response rate was very low (32%) for both groups of students with regard to the R-SPQ-2F Questionnaire, no accurate conclusion could really be drawn. From the responses that emanated from the questionnaire, it became very clear that many students misunderstood its purpose, although the lecturer did explain it to them. Some students made fun of the questionnaire and completed it incorrectly, while others completed only half of the questionnaire. The results indicated that students failed to judge questions accurately, with an over-appraisal of a deep approach to learning prior to the study strategy intervention that did not match students' performance in the pre-test. This over-confidence of students that they do follow a deep approach to learning is of real concern. All of these factors therefore made a contribution to the fact that the R-SPQ-2F Questionnaire cannot be seen as a true reflection of students' approaches to learning in this study. Therefore, the second research hypothesis is also rejected, as it was found that the mean difference score on the R-SPQ-2F Questionnaire for the experimental group was not significantly higher that the mean difference score of the control group.

In order to obtain richer data on the students' approaches to learning, the researcher complemented the more formal quantitative tests with additional qualitative information. The researcher made use of a reflection diary in which she noted students' problem-solving approaches and techniques. The aim of the reflective diary was to gain insight into students' problem-solving behaviour. The researcher observed the students during the tutorial classes in the first semester and reflected on the activities, students' problem-solving approaches as well as the reaction to the general implementation of the proposed classroom learning strategy intervention. With regard to the qualitative observations, the following findings emerged:

- Students with no mathematical background, in both the experimental as well as the control group, said that they felt at a disadvantage and also inadequate regarding the subject *Business Calculations*.
- Some students admitted that they followed the wrong approach when studying mathematics, for example rote learning.
- Some students said that they felt lost when doing problems on their own, while, when in class, the work seemed easy as long as the lecturer explained it.

5. CONCLUSION AND RECOMMENDATIONS

Although the results of the pilot study were not significant, the researcher recognised that many students enter university without the necessary study skills regarding a mathematics and statistics-related subject.

The integration of a learning strategy intervention as part of the learning process has a broader focus than mere reinforcement of practising exercises through tutorial classes, which was the traditional study method followed by the control group of students. What the results above suggest is that the learning strategy intervention did not guarantee mathematical success, or high marks in the relevant subject. However, the study strategy might have been beneficial to students with *no* mathematical background in the sense that it gave them the necessary study skills in respect of a mathematics and statistics-related subject. On the other hand, students with some mathematical background may have been used to their own way of studying mathematics, or did not find it necessary to change their already established and ingrained study habits.

Although the quantitative results of the pilot study, as well as the main study, were not significant, it became clear from students' remarks and the researcher's own observations during the tutorial classes, that the classroom learning strategy had a positive impact on students' approaches to learning.

The findings of this research can provide other universities with some broad guidelines or indicators with regard to a learning strategy for third-year students that take a mathematics and statistics-related subject. The researcher encourages other educators in mathematics and statistics-related subjects to follow a constructivist style of teaching that will promote deep learning and at the same time encourage students to participate actively in the learning process. Educators are also encouraged to teach students "how to learn", by means of a classroom learning strategy, and not just blindly "model" exercises from textbooks which are readily available to them.

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The Effect of Parents Training Program to Enhance Social Skills of Children with Autism Spectrum Disorder

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Abstract

The purposes of this research were to study the results of parents training program to enhance social skills of children with autism spectrum disorder and study the results of parents training program to develop social skills of children with autism spectrum. The research methodology was based on action research to develop parents training program. The tools used consisted of 1) Parent's guide was rated as very good level. 2) The Evaluation forms on the results, such as the focus group, practice of parental activities, parental ability assessment model for autistic spectrum disorders, social skills assessment model for children with autism spectrum. The evaluate performance was quality assessment form parent's guide to evaluate by quantitative and qualitative data analysis with mean percentages and standard deviation and descriptive lectures.

The research results were as follows

1. The result of the program, parents have a better understanding of the behaviour of children with autism spectrum and it has the ability to enhance the social skills of children with autism spectrum is rated as very good level.
2. The result of the programs is the social skills of children with autism spectrum can enhance the social skills of children with autism spectrum is rated as very good level.

Keywords: *Children with autism spectrum disorder, Program for parents, Social skills.*

Introduction

Thailand prioritizes on education for people with special needs. The National Education Act, BE 2542 (1999), as amended (No. 3), states that education must be for the development of Thai people. The whole body, mind, intellect, knowledge, and moral are ethical. And living together happily with others and equal opportunities in basic education are not less than 12 years, the state must provide thorough and quality without the individuals problems with physical, mental, intellectual, emotional, social, communication and learning disabilities or a physically disabled person or person who cannot depend on himself or herself without supervision and disadvantaged. The person must have the right and opportunity to receive basic education in a special way, either from birth and free of charge. The person shall be entitled to receive facilities, media, services and other educational assistance in accordance with the rules and procedures prescribed in the Ministerial Regulations (The National Education Act, 2010). Nowadays the development of individuals

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with special needs is under the principle of equal rights and equality in the development of equality and equity. Taking into account the ability, attention, aptitude, individual needs, and the core of Participation of stakeholders Therefore, the Ministry of Education has set up a plan of action and strategy to develop education for people with special needs.

The Special Education Centre is an educational institution under the supervision of the Office of Special Education Administration. Rehabilitation and preparation for disabled students with 9 disabilities To provide education as a first aid centre. Develop preparedness for the disabled Transition to education for the disabled Encourage support for integrated learning. Organize support systems, media facilities, media services and other educational assistance in accordance with the ministerial regulations. In addition, The Office of Special Education Administration Discuss the importance of developing potential children with special needs. Therefore home and family are the most important factors in developing children. Parents should be involved in activities to prepare them for the development of skills based on their potential and readiness. The role of family members in the development of potential children with special needs is effective and effect role in preparing and developing skills. The family members must have knowledge and skills in parenting. Be ready to deal with problems and provide the right assistance for the needs of children with special needs. This will be beneficial for all aspects of development. (Office of Special Education Administration, 2008)

Children with autism spectrum disorders are three developmental defects, social interaction, social communication, and imagination (based on data from the American Psychiatric Association DSM V: Diagnosis).The children with autism spectrum are being in the autism spectrum group, what the spectrum is defined as the degree of defect in the development of the periphery. Show signs clearly in childhood. It contributes to the development of social relationships, communication is not normal and unusual behavioural interests. The prevalence of autism varies greatly from 0.5-11 people per 1,000 population (5-10). At present, the prevalence of autism is very high are averaged one person per 100 normal children. In Thailand, about 1 child per 1,000 children (11) and in children 3.5-6.5 times (1.4.8) because the medical, parents and people are knowledgeable that can be diagnosis faster. The trend is really rising from the research statistics in the journal articles both domestic and abroad found. Currently, the prevalence of autism among Thai children aged 1 to 5 years is 8.8: 10,000, which is close to that of many foreign countries. It is between 3.3 and 16: 10,000 people. The educational services provided are preparation initial support, and basic education. There are many other target groups. There is no promotion and rehabilitation service yet. This has resulted in many social consequences. Social isolation Denial of society Cause Psychopathy Society lack of awareness and understanding including economic impact, the country lacked labour force, developed country, and lost a lot of budget to maintain. (Thai Autistic Foundation, 2010)

Social skills are a major problem for children with autism spectrum disorders. Because children with autism spectrum lack understanding of social norms. The interaction is not natural. Social behaviour is not appropriate for ages. They ignore what is going on around even a family member. There is limited scope for facial expressions and emotional inconsistencies, cannot be recognized for facial expressions and gestures because children cannot read the mind (Penghat, 2001). Social skills are one of the key skills that be part of human life limitation of waiting understanding communicating with others causes them to have a lot of problems living with other people in society. Children are often parodied or not recognized by the group, difficulty adjusting emotional control of coexistence and activities with groups would affect children's learning and social attitudes towards children and families are not in the wild. Parents often get blame or accusation from outside people who

look at the child at the time of public problem behavior, "baby not being", "baby""do not educate children", both behavior is caused by the condition. Limitations of people with special needs. (The Thai Autistic Foundation, 2004).

Families with autism spectrum disorders have encountered many problems, such as stress, family relationships, husbands and wives. Or with other family members Modifying and Developing Social Skills for Children with Autism Spectrum Disorder can be able to adapt like the normal people. It would be better to do it from the outset with the right social skills by age and family-dependent in collaboration with all multidisciplinary collaborators. From the lack of social skills of children with autism spectrum, there are different levels of violence in each person. The way to develop social skills for children with autism spectrum may be in several ways, to suit each child is different such as playing together with friends of the same age. Using social stories, using comic script conversations, cognitive scripting, social interaction with adults, role play, awards, video modelling, power card, games, direct social skills teaching And prompting, etc. (Prasong Arany Winyu, 2008).

Parents have a direct role in helping children with autism spectrum. The best way to help children with autism spectrum is to collaborate with family members. In order to be able to help suit the needs of each child. Families is the most important role in promoting development include behavioural modification. There are activities and techniques to provide family-specific assistance. Learning provides opportunities for all concerned parties to participate in new approaches for teachers, parents, communities, independent parenting, education, curriculum, and management of learning that fits in with the local community. Reducing the central command rules framework that parents take part in making decisions. Related to school Provides extensive opportunities for parents to become involved and influence the lives of their children's schools. Most parents will attend parent meetings and other school activities, which is a good way to know about the lessons and everyday life at school, including the progress of your child's learning. At the same time, it also met with other parents. The relationship of teachers and parents to children has a great impact on the success of helping children learn at their full potential for responsible and adaptable learning process in the classroom to use in everyday life is appropriate and can support essential to promote the potential of parents to participate in education. Because parents lack understanding and understanding of the development and practice of children's learning skills as well as the promotion of education. Most parents of children with autism spectrum don’t have knowledge and ability include techniques to assist children with autism spectrum. Especially social skills, it is an important skill for children that should be developed. So that children with autism spectrum can live happily in society. The problematic behaviour of children is analysed in small steps and then planned by a parent or close friend. The children could learn from the natural and real environment in different situations. The teacher could teach clearly so that children will be able to understand and learn how to behave in situations and the reinforcing systematic behaviour will be effective. (Umpop Trangangsombat, 2002)

Special Education Center Roi Et Province provides children with special needs of all types include children with autism spectrum. The researcher group worked as a special education teacher. The researcher found the problem of parental care such as the home is far from the provincial special education centre and parents are poor. At the same time, parents lack the knowledge, understanding, lack of skills to care for children with special needs for accept or have enough morale to care for people with special needs. Children with autism spectrum disappeared from the family and the community did not get involved for help in any way. It is a space for access to the true right and there is a tendency for children with autism

spectrum to be left alone with their families. The primary problem parents face in developing children with autism spectrum disorders is lack of proper parenting knowledge and skills in coping with the problem. The inappropriate response such as indulgent child when the children exhibit some inappropriate behaviour. The more children in this group are learning inappropriate. and show more problematic behaviour. Parents are frustrated with parenting and emotional support. For such reasons. Researchers are interested in finding ways to provide assistance in developing a social skill for children with autism spectrum disorders. To help parents or caregivers develop their teaching skills in the social skills of children with autism spectrum to enable children with autism spectrum can live in society as well as and more response preparing for participation and prevent behavioural problems of children with autism spectrum before leaving family to extraterritorial society. This is a process that affects the development of social skills and a guide to the development of social skills of children with autism spectrum to create and maintain relationships with others more durable. and continue to use in society freely.

Research Objectives

1. To study the results of parents training program to enhance social skills of children with autism spectrum disorder.
2. To study the results of parents training program to develop social skills of children with autism spectrum.

Method

1. The target was child with autism at 3 years-old who have been service in Step Plus Centre and diagnosed by a physician and must be joined in the personal development training program. The child with autism, the level of readiness to walk and walking around with spin around yourself jump up and down to switch legs. Parents of children with autism spectrum disorders with registered children receive services in accordance with regulations at The Roi Et Special Education Centre in Roi-Et province and children with autism spectrum registration in accordance with regulations at the Centres for Disease Control and Prevention. Special study in Roi-Et province by persons by Purposive Sampling.
2. Variables in Early Childhood Variables Research Program to Enhance Social Skills of Children with Autism Spectrum. Variables Based - Parental Ability to Enhance Social Skills of Children with Autism Spectrum And improve the social skills of children with autism spectrum.

Research Methodology

This research is an action research study (Yupa Pongboriboon, 1994). There are 3 phases in each phase, followed by four stages of action plan , observe observation and reflection: Each phase spins the process of development and improvement.

Research tools

This research. Researchers have created the following tools:
1) Focus group recording.
2) A Parent's Guide to Strengthening the Social Skills of Children with Autism Spectrum.

3) Parental Ability Assessment Model for Children with Autism Spectrum
4) Social skills assessment of children with autism spectrum

Data analysis

A study of the effects of parental programs for enhancing the social skills of children with autism spectrum that use data analysis by describing data and using statistical data for data analysis. The basic statistics are percentage and mean.

Conclusion and Discussion

1. The results of the program for parents, they were have better understanding of the behaviours of children with autism spectrum and it has the ability to enhance the social skills of children with autism spectrum is rated as very good level.

2. The results of the programs to social skills of children with autism spectrum were can enhance the social skills of children with autism spectrum is rated as very good level.

Researchers can discuss the results for the following purposes:

1. The results of the program for parents to enhance the social skills of children with autism spectrum is as follows. Prior to using the parental knowledge program, there was no knowledge of the social skills of children with autism after using the program and assessing parental abilities, it was found that there was an average of cognitive skills in enhancing the social skills of children with autism spectrum. It was concluded that parents had a better understanding of the behaviour of children with autism spectrum and were able to enhance the social skills of children with autism spectrum at a very good level. From the average, the cognitive ability of parents to use the program has increased in rating scores.

2. The results of the program for parents discussion is as follows: Mean Behavioural Assessment of Social Skills of Children with Autism Spectrum from the use of the guide and the ability of parents to enhance the social skills of children with autism, the spectrum has social skills behaviour in perception and emotional expression. The interaction with others practice in society and play side have better behaviours, respectively. Thus, it can be concluded that the use of parenting programs to enhance the social skills of children with autism spectrum can improve the social skills of children with autism spectrum at a very good level.

Recommendation

1. General Suggestions

1) Child training activities with autism spectrum can provide fpr all family members.

2) The child's social skills should be re-examined and the time taken for observation of children's autism spectrum to become more socially competent.

3) Other social skills should be explored in children with autism spectrum differentiation.

2. Research recommendations

1) It is recommended to adopt a pattern based on the use of parental programs to enhance the social skills of children with autism spectrum use in other skills development.

2) It is recommended that the model be used to measure the effects of parental programs to enhance the social skills of children with autism spectrum in other children.

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The Implementation of Project Method Toward the Cooperation Behavior of Autism Children

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Abstract

This research was conducted because of the importance of social behavior to be developed to autism children since early age. One of the social behavior aspects which needed to be developed was cooperation behavior. It seemed to the autism children's behavior which was very individualist and closed in finishing everything. Through project method autism children were directed to finish the class picket duty with cooperating together with classmates. This research had purpose to prove the influence of project method toward cooperation behavior to autism children of group B in Kindergarten Insani Mandiri Sidoarjo. This research used quantitative approach with *experiment* kind with *single subject research* and the research arrangement was A-B-A. The subject was all autism children of group B in Insani Mandiri Sidoarjo numbering one child whose social behavior of cooperation aspect needed to be developed. The data collection technique used observation. The data analysis technique used descriptive statistic with visual analysis in condition and visual analysis among condition.The research result indicated that project method could decrease cooperation refusal behavior to autism children of group B in Kindergarten Insani Mandiri with the average frequency to baseline phase (A1) 3,5, intervention phase (B) 0 and repeating baseline observation phase (A2) 2,5. From the overlap data it indicated that the small percentage value was 20% which meant project method influenced toward cooperation refusal behavior to autism children of group B in Kindergarten Insani Mandiri Sidoarjo.

Keywords: *Autism Children, Cooperation Behavior, Project Method*

Introduction

Each child had the opportunity to have their role in society, the social behavior, especially for the cooperation behavior in children need to be stimulated as early as possible in order to achieve the expected social behavior in society. Benefits of cooperation for early childhood is to foster a sense of togetherness, liveliness and courage (Hidayati 2014: 18) In early childhood need to be given a solid foundation in order to avoid emotional or personality disorders.

According to Anita (2011: 54) in early childhood normal social behaviors that can be developed maximally are : tolerance towards others, cooperate with friends, easy to mingle or interact with others, can communicate with people who are known, imitate the activities Adults, willing to share, help, be able to follow the game, be able to obey the rules, be able to focus, be able to control the emotions, appreciate the work of others, show the natural emotion and so on. In contrast to early childhood autism, social behavior of early childhood

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autism does not show such behavior, autism children show high anti-social behavior in various aspects, one of which is refuses to cooperate in various activities carried out daily.

Bonny (2003: 25) states that social behavior of autism children is different from normal children in general. Children with autism have excessive behaviors or deficient behaviors. Excessive Behaviors on autism children for example is tantrums, while deficient behaviors is improper social behavior. Inappropriate social behavior can be described by anti-social behavior.

Based on preliminary observation in December 5, 2015 it was found that there are two autism childrens who show anti-social behavior in the Insan Mandiri School Sidoarjo City Indonesia. The anti-social behaviors including : the lack of cooperation behavior carrying out all activities. This is happens due to absence of stimulus that encourages children to become social individuals.

There needs to teaching methods that can stimulate social behavior of autism children in school. Learning method is an effort made to implement the lesson plan that has been prepared. In this research, using project methods. The project method is one of the methods used to train children's ability to solve problems experienced in daily life. This method can move the child to cooperate whole heartedly. Cooperation was done in an integrated manner to achieve society goals (Isjoni 2010: 92).

Implementation of the project method in this research is by confronting autism children on a simple problem which should be solved together with classmates. Problems to be solved are class picket activities that will be modified to reduce the cooperation rejection behavior of autism children. Owned social behavior autistic children are different from normal children in general. Children with autism have excessive behaviors (excessive) a tau needy behavior (deficient).

Previous research by Widiastuti (2011) on " Project Learning Based on Local Culture to Stimulate Multiple Intelligences of Early Childhood", in the display have been presented stating that the project method gives children the opportunity to explore the five senses and their body in certain activities with fun. Based on this research it can be concluded that there is an influence of project learning to increase multiple intelligences of early childhood.

This is in accordance with the intent of the researcher is to optimize the intrapersonal intelligence of autism children which is the social behavior, with aspects of cooperatio. The different between the previous research with this research that now apart from the research subject, research place and research aspects the previous research used project learning to stimulate multiple intelligences of early childhood whereas this research has a purpose to improve the social behavior of autism children. Based on the description above, this research focused on the subject of social behavior problem autism children. That’s why its necessary to held a research on "the implementation of project method thoward cooperation behavior of autism children.

Literature Review

Cooperation is an effort or a variety of actions that humans do to produce behavior which related to life and social interaction. In social life, behavioral patterns that are sensitive to social stimuli, especially the pressures and demands of community life and learning to mingle with the social environment is the pattern of behavior expected by society. A good pattern of social behavior is reflected in each individual's actions in accordance with the prevailing norms or not.

But autism children showed the failure of interpersonal relationships characterized by the lack of response toward people around them, treat others without individual differences showing lack of inability to foster cooperative game or have a friend with children of his age, experience a disruption in communication skills both verbal and non-verbal, experienced aphasia nominations, which is make them uable to give names to the objects around them.

Moeslichatoen (2004: 142) declare that the benefits of implementing project method for early childhood autism is to develop healthy and realistic personal which has characteristics of independence, self-confident and able to adapt, to develop interpersonal exchange and willing to accept the reality, the project method emphasizes responsibility shifted from teacher to children, it can be used to develop and foster an attitude of cooperation and social interaction among children involved in learning with project method, to be able to complete their task in togetherness effectively and harmoniously. Each of children will learn to take responsibility for their task.

Method

This research use ABA Design. ABA design shows a causal relationship between dependent variable and independent variable. The ABA design implementation can be initiated by continuously measure the target behavior at baseline conditions (A1) with a certain time period after the intervention condition (B) after the measurement in the intervention condition (B) measurement at the second baseline conditions (A2) is given. The addition of the second baseline condition (A2) is intended as a control for the intervention phase making it possible to draw conclusions about the functional relationship between dependent variable and independent variable.

According to Sunanto, et al., (2005: 62) explains that there are some things that need to be considered to improve the validity of research by using ABA design including :

1. Defines the target behavior as a measurable behavior
2. Measure and collect data at baseline condition (A1) continuously at least 3 or 5 or trend and data level becomes stable
3. Provide intervention after data trend of baseline is stable
4. Measure and collect data at the intervention phase (B) with a certain period of time until the data becomes stable
5. After data and data rate trends in the intervention phase (B) are stable repeat the baseline phase (A2)

The research design can be seen in figure 1 bellow :

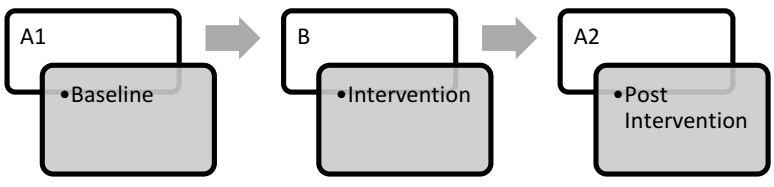


Figure 1 : Research Design (Sunanto, J 2005)

Baseline (A1) is a condition in which the target behavior is carried out in a natural condition prior to any intervention. Measurements are made to determine the social behavior of children. Intervention (B) is experimental conditions in which an intervention has been

provided and the target behavior measured under those conditions. Subjects are given treatment through project method in an effort to improve social behavior through class picket activities that will be done with friends. While post intervention is the measurement after the given treatment. The intervening phase makes it possible to draw the conclusions of functional relationships between dependent and independent variable.

Subject of this research is one autism student in the Special School Insan Mandiri Sidoarjo. Based on the previous observation autism children have impaired social behavior which is the lack of cooperation behavior. While the cognitive abilities of the students is same as normal students in general.

Independent variable is a variable that affect or cause changes in dependent variable. In this research which project method is the independent variable. Project method according to Moeslichatoen (2004: 137) is one way of giving a learning experience by bringing together children with everyday problems that must be solved in groups.

Dependent variable is a variable that is affected by the independent variable. Dependent variable in this research is the cooperation behavior of autism children. Autism children's cooperation behavior can be demonstrated by failure to build and start activities related to others including cooperation. This not only becomes a difficulty for autism children but a complex problem for them because the cooperation involves social interaction in groups and have the same goals with each other, so that becomes a special problem for autism children.

Findings / Analysis

Based on the research result shows that project method has an influence on the cooperation behavior of autism children. Therefore, the description of research activities before and after implementing the project method is as follows:

1. Observations Result About Autism Children Cooperation Behavior on Baseline Phase (A1)

At the baseline phase (A1), four sessions were observed to measure children rejection to cooperate without intervention. Observation is done by counting how many times the child refused to be invited to work together in cleaning the classroom within a previously determined time.

2. Observations Result About Autism Children Cooperation Behavior on Intervention Phase (B)

In continuous observation phase during five sessions by giving intervention in the form of class picket activities. Observation is done by counting how many times the child refuses to be invited to work together in cleaning the class.

3. Impelementation Result About Autism Children Cooperation Behavior on Second Baseline Phase (A2)

In the post-intervention phase observation is not done directly after the intervention, there is a need for a pause for the updated treatment. The researcher gave the time lag for 7 days. Observations were made during 4 sessions, by counting the number of times the child refused to be cooperated in cleaning the classroom.

All of these result can be seen in Table 1 bellow :

Table 1. Observation Results of Autism Children's Cooperation Rejection Behavior

Phase	Sessions	Frequency Um
Observation (A1)	1	4
	2	4
	3	3
	4	3
Intervention (B)	5	0
	6	0
	7	0
	8	0
	9	0
Observation (A2)	10	3
	11	3
	12	2
	13	2

Based on the above table above it can be seen that in the baseline phase (A1) observation was conducted for four sessions, intervention (B) was done during five sessions and baseline (A2) post intervention conducted during four sessions. At each baseline observation session (A1), Intervention (B) and baseline (A2) post-intervention observing the cooperation behavior of autism children by impementing project method in classroom picket can be shown in this several table.

4. Results of Visual Analysis in Social Behavior of Autism Children

If all six components of visual analysis are included in the summary format, the results are in the table 2 bellow :

Table 2

Recapitulation of Visual Analysis Results

No.	**Condition**	**A1 / 1**	**B / 1**	**A2 / 1**
1.	Length of condition	4	5	4
2.	Estimation of tendency direction	 (-)	(=)	 (-)
3.	Stability trends	Stable 100%	Variebel 0%	Stable 100%
4.	Estimated data traces	 (-)	(=)	 (-)
5.	Stability level and range	Stable (3-4)	Variable (0-0)	Stable (2-3)
6.	Level of change	(4-3) + 1	(0-0) = 0	(3-2) + 1

The results of the analysis in conditions of autism children's cooperation rejection behavior (A1) show that the length of the condition is four sessions, the tendency of stability shows that data results are stable with a percentage of 100%, the line on the estimated of tendency direction and the estimated data traces has the same meaning that is in the phase observation (A1) direction of the trend decline, the level of stability and range shows stable data in the range of 3-4, and observation phase-change level (A1) indicates the sign (+) which means autism children's cooperation rejection behavior experience positive change.

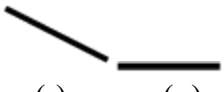
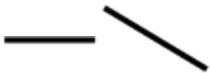
The results of the analysis in conditions of autism children's cooperation rejection behavior (B) shows that the length of conditions is five sessions, the tendency of stability shows the results of the data is not stable with the percentage of 0%, the line on the estimated of tendency direction and the estimated trace data has the same meaning that the intervention phase (B) the direction of the trend is static, the level of stability and range indicates the data is variable or unstable with a range of 0-0, and the level of change in phase intervention (B) shows signs (=) which means that the autism children social behavior in the aspect of cooperation is not change.

The results of the analysis in conditions of autism children's cooperation rejection behavior (A2) shows that the length of the condition is four sessions, the tendency of stability

shows the results of the data that is stable with a percentage of 100%, the line on the estimated of tendency direction and the estimated trace data has the same meaning that is the phase of observation (A2) direction of the trend decline, the level of stability and range data shows stable with the range of 3-2, and the level of change in baseline phase (A2) indicates the sign (+) which means that the autism children social behavior in the aspect of cooperation have a positive change.

5.Result of Inter Condition Visual Analysis

Inter condition visual analysis include five components that can be seen in table 3 bellow :

No	Comparison of Conditions	B1 / A1	B1 / A2
1.	Number of variables changed	1	1
2.	Changes in trend direction and its effects	 (-) (=)	 (=) (-)
3.	Changes in the tendency of stability	Stable to Variebel	Variable to Stable
4.	Level change	3 - 0 = 3	3 - 1 = 2
5.	Percentage overlap	$\frac{4}{5}$ x 100% = 20%	$\frac{4}{5}$ x100% =20%

The result of visual analysis between observation phase (A1) with intervention phase (B) in autism children's cooperation rejection behavior baseline indicates that the number of variables in this study is one, changes in direction tendency show a decrease, stability trends change shows stable data to variable, level changes show data (+) which means positive, and the percentage of data overlap shows 20% which means that the intervention program affect the target behavior which is the autism children's cooperation rejection behavior.

The results of inter-condition visual analysis of autism children's cooperation rejection behavior between the intervention phase (B) with a baseline observation phase (A2) showed that the number of variables in this study is one, changes in direction tendency show a decrease, stability trends change shows variable data to stable, level changes show data (+) which means positive, and the percentage of data overlap shows 20% which means that the intervention program affect the target behavior which is cooperation rejection behavior.

6.Results of Data Analysis in the Bar Chart

The results of the data analyst in a bar chart can be determined by comparing each subject's ability then searched accumulated average frequency in each phase for each subject as shown in figure 2 bellow :

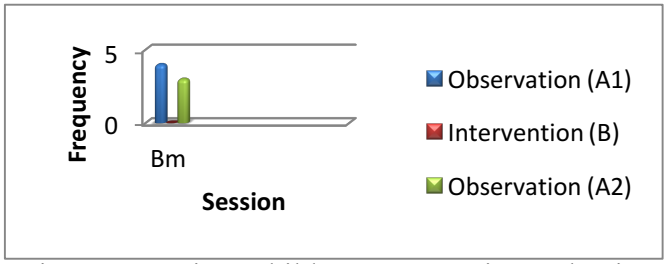


Figure 2. Autism Children Cooperation Behavior

Based figure 2 above it can be seen that social behavior of autism children does not show significant data difference. Shown with the results of all subjects having an average of nearly the same frequency as data reduction from the baseline observation phase (A1) to the second baseline observation phase (A2). This suggests that the outcomes of interventions that have been performed have an influence in autism children's cooperation rejection behavior although not significantly.

After analyzing the comparison of the subjects, it can be concluded that the autism children's cooperation rejection behavior shows the decrease of data from the baseline observation phase (A1) to intervention (B) and from the intervention phase to baseline observation (A2), these three things show that there is an influence of class picket project method toward autism children's cooperation rejection behavior although not significant.

Based on the data analysis and hypothesis testing about the influence of the project method toward autism children's cooperation rejection behavior showed a decrease in the cooperation rejection among autism children with one another by using the class picket project method as an intervention. The benefits of cooperation for early childhood is to cultivate a sense of togetherness, liveliness and courage (Hidayati 2014: 18). This is in accordance with the opinion of Moeslichatoen (2004: 142) who stated that is to develop healthy and realistic personal which has characteristics of independence, self-confident and able to adapt, to develop interpersonal exchange and willing to accept the reality, the project method emphasizes responsibility shifted from teacher to children, it can be used to develop and foster an attitude of cooperation and social interaction among children involved in learning with project method.

In the baseline phase (A1), autism children have social behavioral barriers, namely the lack of cooperative behavior between one another. This is in accordance with the opinion of Safaria (in Mudjito, 2013: 27), who says that children with autism showed the failure of interpersonal relationships characterized by the lack of response toward people around, treat others without individual differences, showing lack of inability to foster cooperative game (cooperation) in accordance with the opinion. This is evidenced by the results of baseline phase (A1) testing, which still has an high average of rejection.

In the intervention phase (B) using the project method shows a decrease in the refusal to cooperate in the implementation of class picket. The intervention was given intensively for five sessions , all the preparation of the project has been prepared by the researcher to support the maximal implementation of the class picket. The implementation of the project method is more easily understood by the child because the intervention is given in a simple way by

confronting the child in a dirty classroom situation then the child is directed to clean the classroom by working together. This is in accordance with the opinion of Siegel (in Nawawi et al, 2009: 12) who states that individuals with autism are easier to obtain visual information of two or three-dimensional than the auditory stimulus.

Based on the results of the baseline (A1) phase, the intervention phase (B) and baseline (A2) were conducted to test the effectiveness of the project method. In social behavior of autism children aspect of cooperation of subject has the highest rejection rate at baseline phase (A1) that is four at phase of intervention (B) that is 0 and at baseline phase (A2) that is three. Based on average data acquisition above can be concluded that the project method has an influence on the social behavior of children with autism which is decreased rejection after being given intervention so that it can be seen that the project method has an influence on the autism children's cooperation rejection behavior in Special School Insani Mandiri Sidoarjo. Implication of the project method to children with early autism beside to reduce the cooperation rejection behavior but also can optimize the social behavior of other aspects. The project method can also be used as a method to optimize cognitive aspects in early childhood. Based on the research that has been done to answer the research problem that there is influence on the autism children's cooperation rejection behavior of autism children in the Special School Insan Mandiri Sidoarjo. This is because through the project method given to the child through the class picket activities give full responsibility to the child to optimize the social interaction

Recommendation

Based on the result of the research, it can be concluded that the project method can decrease the rejection behavior of the autism children with the average frequency in the baseline phase (A1) 3,5 followed by the intervention phase (B) 0 and the second baseline observation (A2) 2.5. From both of overlap data showed small percentage value that is 20% which means project method influence autism children's cooperation rejection behavior.

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Multicultural Education Assessment among Junior High School Teachers and Its Implication

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Abstract

Multicultural Education is a worldwide education movement that encourages students to retain their cultural identities. It is a field of study and an emerging discipline whose major aim is to create an equal educational opportunities for students from diverse cultural groups. The teacher in a multicultural classroom is faced with great challenges on how to keep these diverse students engaged and succeed academically in a multicultural setting.

The objective of this study is to assess how multicultural the teachers' teaching in the ten public junior high schools. One hundred junior high school teacher from three public junior high schools were randomly selected and their concept on Multicultural Education was assessed particularly on the dimension which include philosophy, knowledge, expectation, learning style, test and assessment and the student-teacher relationship.

Result showed that a mean rating of 1.75 on the practices of Multicultural Education domain. This implied that the junior high school teachers rarely exhibited the norms and standards required in teaching with multicultural education approach. The finding is congruent with the negative attitudes of the students towards the course/subject taught by the teachers.

Based on the results of the study, it was found out the junior high school teachers are not multicultural, It is therefore recommended that these junior high school teachers will be advised to attend an in-service training on the basic concepts of multicultural education to equip themselves with the pedagogy of multicultural education in the context of multicultural setting.

Keywords: *assessment, multicultural education, pedagogy*

Introduction

The formidable task of delivering educational service to a country's populace is a responsibility assumed for the most by educational institutions. The extent to which an educational institution succeed in delivering educational service efficiently will depend largely upon the effectiveness of the personnel particularly the teacher who is engaged in the educational process. In this light, the teacher occupies a very important niche in an educational institution.

At the secondary school level, many students have a rather negative view of the different learning areas . Recently, measured by 2015 National Achievement Test (NAT), the achievement level of high school seniors in science particularly in one schools division in Region X of the Department of Education Region showed that the students achieved low mastery which is below the 75% proficiency level. It is the main objective of the study to determine the preconceptions of

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high school teachers about the nature of multicultural education and to determine classroom practices they have been using in a multicultural chemistry class

METHODOLOGY

This study was conducted among the junior high school teachers and students from schools within one schools division. These teachers were purposively sampled. Moreover, the study also focused on students of diverse ethnic group such as Maranaos, Dumagats, Hiligaynons, Higaunons, Ilonggos and Bisayans whom the teachers taught during the academic year 2015-2016. This is a combination of qualitative and quantitative research. It utilized the non-random sample selection because knowledge suggest it is representative or because those selected have needed information. **D**ifferent means of data collection were undertaken to ensure the mode validity of the description that were generated and to ensure that each description was a reflection of many modes of investigation (White and Gunstone, 1992). The researcher observed the teachers in their classrooms for their teaching strategies, techniques, and learning environment to countercheck their responses to the questionnaire and interviews. This might provide the researcher more accurate data to test the rhetoric against the practice (Howell, 1997).

RESULTS AND DISCUSSION

From the interview, it reveals that the teachers' views on multicultural education revolved around how students' ethnic affiliation whether Maranao or non-Maranao or Iloggo or Cebuano. The majority of the teacher samples have little or no knowledge in multicultural education especially its real nature. Some other teachers perceived that in the multicultural setting, the junior high school teachers provide equal treatment to all group.

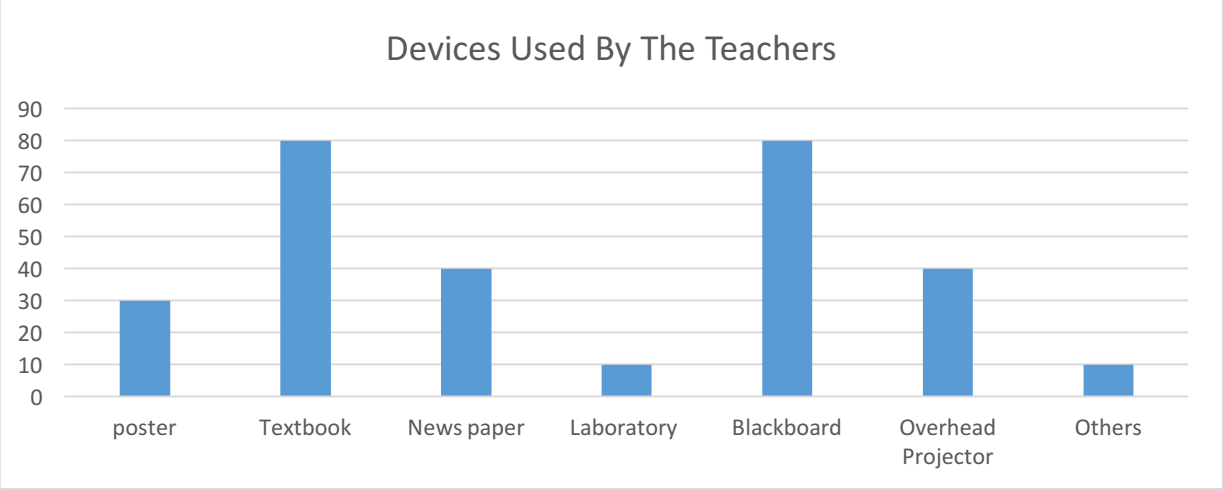

Figure 1. Instructional Devices Used by Teachers

This means the teachers simply relied on the books where the problem solving is inclusive and this is presented on the chalkboard for elaboration. Perhaps their being bookish showed that the teachers either do not have time to make authentic supplementary problem sets to motivate students or they are not risk-takers to explore other modes of teaching or maybe they do not want to get out from their comfort zone since they are already used to such strategy.

Figure 2 showed that lecture and problem solving were widely used by almost all of the teacher respondents coupled with less utilization of practical and guided activity as well as small group activity.

Figure 2. Teaching Strategies Adopted By Teachers

These teachers may have used these most frequently probably because there are ready problem sets incorporated in the book which they can use anytime during lectures and following these maybe stress-free than preparing materials called for in other teaching strategies.

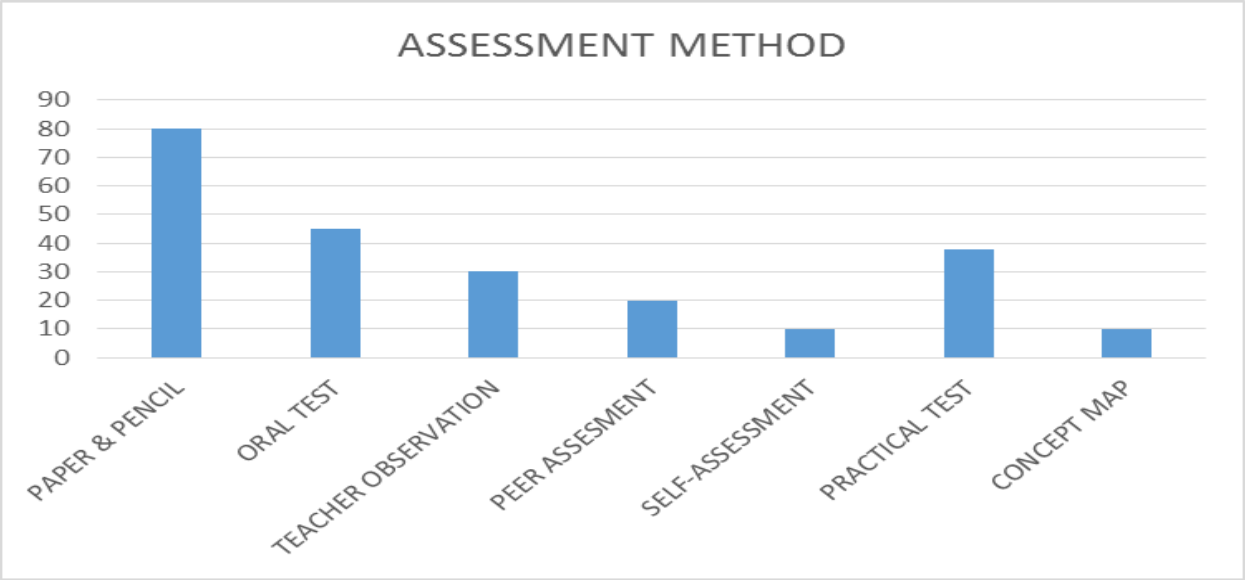

Figure 3. Assessment Methods Use By Teachers

Relative to assessment, the most widely used assessment method is the traditional paper and pencil test. This implies that almost all of the teacher- respondents stick to the traditional assessment method and rarely adopt the non-traditional approaches.

.Table 1. Practices on the Dimension of Multicultural Education Exhibited By Teacher

Station	DIMENSION									
	Philosophy	Knowledge	Expectations	Learning Styles	Teaching Styles	Curriculum	Test and Assessment	Student-Teacher Relationship	Over-all Mean Rating	DESCRIPTION
S1	2	1.75	1.68	1.93	1.7	1.6	1.65	1.93	1.78	Rarely
S2	1.7	1.55	1.56	1.6	1.6	1.76	1.45	1.53	1.59	Rarely
S3	1.9	1.85	1.92	1.93	1.9	1.88	1.9	1.87	1.89	Rarely
S4	1.9	1.6	1.56	1.53	1.6	1.44	1.6	1.87	1.64	Rarely
S5	1.9	1.65	1.84	1.8	1.8	1.64	1.75	1.8	1.77	Rarely
S6	1.4	1.65	1.6	1.67	1.9	1.64	1.6	1.53	1.82	Rarely
S7	1.9	1.85	1.76	1.53	1.9	1.76	1.6	1.93	1.78	Rarely
S8	2	1.8	1.64	1.53	1.6	1.68	1.6	1.93	1.72	Rarely
Mean Rating	1.84	1.72	1.73	1.68	1.76	1.72	1.64	1.79	1.75	Rarely
Description	Rarely	Rarely	Rarely	Rarely	Rarely	Rarely	Rarely	Rarely	Rarely	Rarely

Legend: *Never=1.0 - 1.4 Rarely=1.5-2.4 Oftentimes=2.5 - 3.4 Always= 3.5- 4.0*

This means that the teacher respondents rarely practice the expected norms. Moreover, there may be reasons to believe that teacher respondents did not exert much effort in pacing lessons to support needs of students especially those having difficulties. It could also be due to inadequate knowledge about teaching styles and activities which would accommodate students' learning styles. Lindfors (1984) as cited by Felder (2005) advises that how we teach should originate from how students learn.

Student samples were assessed to establish whether students have some degree of anxiety as they learn in the classroom. The 35% who sustained that they never like their subject., The 45 % further revealed that they feel like being forced to study and evidently the 45% of the students strongly agree that they do not see any values in learning. In general, the students have negative attitude towards the subject. Perhaps, their attitudes were influenced largely on the insufficient teaching strategies adapted by teachers and the inadequate instructional device designed by teachers. The traditional way of teaching probably contributes to the negative attitude of the students towards and the poor performance of the students.

The attitude of the students towards correlates to the students' performance in. With the assessment given, only twenty seven (34%) got a score of fifty percent and above. This could be due to the undifferentiated teaching strategies used by the teachers, equal treatment of students and their intolerance with the diverse students in the classroom.

CONCLUSION

1. They treat students equally regardless of their individual differences. They assumed that students belong to only one culture despite their knowledge of the ethnic groups where the students belong thus they prepare a one fit all strategy in the classroom.
2. The teaching-learning process were simply teaching without providing maximum student participation. The teachers rarely provide minimum opportunity to get students involved and participated in various authentic activities that suit the multiple intelligence of the students.
3. The teachers had inadequate awareness and acknowledgement of the learning style, multiple intelligence and need of learners. Strategies for the needs of differentially-abled students as well as the recognition of multicultural background of students in the teaching-learning environment where not maximized. The teacher did not exert much concern on the exploration of approaches to address needs and difficulties of earners having different learning preferences. Moreover, the dimension of multicultural education was vaguely evident in the learning atmosphere.

RECOMMENDATION

To be an effective multicultural educator and an effective instructor, a teacher must continue self-examination and transformation. Nelson (2001) argues that having a socially held belief system and valuing racial and cultural differences are the keys to improving equal opportunities for all students.

It is recommends that it is necessary to approach teacher training from moral and attitudinal perspectives, along with the understanding of the implications of multicultural education from educational and methodological positions.

Likewise, it is recommended that more multicultural education training be made nationwide for the transformation of the public teachers of the Department of Education within the country.

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Academic Performance of Grade 8 Students in Araling Panlipunan with Multimedia as Remediation

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ABSTRACT

Students engagement in the teaching-learning process is one of the many challenges an educator encountered in the classroom setting. However, with strategic intervention, problem such as sustaining students' engagement is remediated.

This study atttempted to assess the academic performance in Araling Panlipunan among Grade 8 Students. The Grade 8 samples were given a pretest and a post-test in a certain Araling Panlipunan concept within a specific competency. There was an intervention made after the pre-test. Specifically, a multimedia was designed as an intervention. Hence, the effect of the intervention was sought.

Based on the result of the study, samples who were exposed to multimedia intervention have positive attitude towards the subject matter. It was further found out that these students have academic performance significantly higher than those without exposure to multimedia. It is therefore recommended that multimedia be inter-related in the teaching-learning process. Moreover, it is recommended that teachers will find ways to adopt the multimedia as part of their remediation program to enhance the students' learning experience.

Keywords: *academic performance, ict, multi-media*

INTRODUCTION

As technology and visual images become more integral to society, schools have reflected this change by incorporating multimedia technology like sound, video and slideshows into classrooms. Whether teachers assign projects that require audiovisual content or use music or multimedia is able to engage student interest and present many topics in a more vivid, effective way.

Recently, computer-aided instruction are encouraged for adoption in the academic institution. When properly used, computers can improve learning effectiveness and efficiency (Christmann et al., 1997). People learn better in environments where appropriate navigational

The teachers in the academe are challenge to provide more effective and efficient learning environments and educational experiences to their learners (Morse, 2003). The learners' academic performance can be measured through pre-test and post -test usually administered at the start and at the end of every quarter, respectively. However, in many cases the results are not satisfying. The teacher's effort and the student's commitment are not compensatory. In Cabalantian National High School, Social Studies or Araling Panlipunan is one of the least mastered subject in Grade 8 as revealed in summative test as well as on

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National Achievement Test result. Test results showed that students usually get low academic performance in social studies particularly in Araling Panlipunan 8 which is World History.

In this light, a remediation using multimedia via powerpoint presentation is adapted . It aimed to assess the impact of the powerpoint presentation as strategic intervention to address the academic performance problem. This will try to disprove the null hypothesis that there is no significant difference on the academic performance of the students before and after the intervention was made. Specifically, this research will answer the following questions:

1. What is the academic performance of students exposed to multimedia?

2. What is the academic performance of students who are not exposed to multimedia?

3. Is there a significant difference in the academic performance of the students exposed to multimedia and students not exposed to multimedia?

4. What is the impact of the powerpoint presentation as classroom intervention to the academic performance of the students in Araling Panlipunan 8?

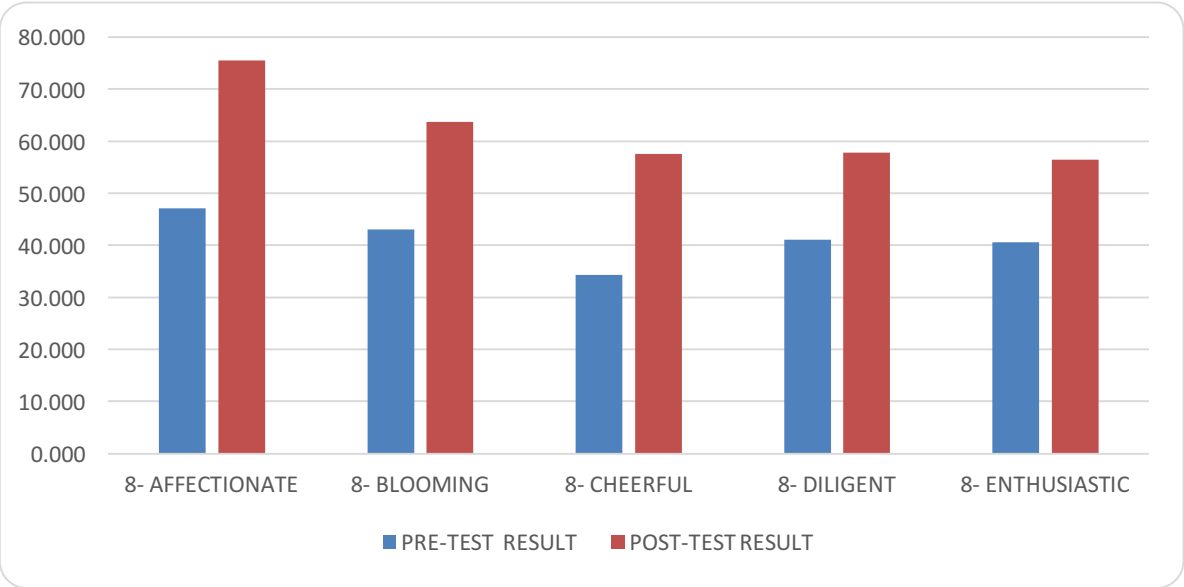
METHODOLOGY

This study was conducted at Cabalantian National High School at Manticao Misamis Oriental. The sample for this study includes seventy nine (79) students purposively sampled from five heterogeneous sections in Grade 8 enrolled in School Year 2016-2017. These students generally have achievement level below 50%. There is no attempt to compare the students' performance in Araling Panlipunan with other learning areas. Students were assessed on their knowledge and perceptions before and after the multimedia instructional material was introduced. A set of the questionnaire for the pretest and post-test was employed to both groups of students. Grade 8 – Enthusiastic in the control group (1) received the instructor-led orientation and practice session, (2) completed the pretest, (3) completed the post test at the end of the first quarter. Grade 8– Cheerful in the experimental group (1) received the instructor-led orientation and practice session, (2) completed the pretest, (3) had their hands-on experiences and had an access to the instructional multimedia material during the first quarter, and (4) completed the post test at the end of the first quarter. Informal interview was also conducted to come with saturated data. The t-test was used to determine the significant difference of the academic performance of the students who are exposed to multimedia to those students who are not exposed to multimedia.

RESULT and ANALYSIS

Result showed (Figure 1) that student showed that students' academic performance before the multi-media intervention is lower than the academic performance after the intervention was made. Specifically, the academic performance of Section Cheerful which was exposed to multimedia content instructions as remediation accelerated during the Post – Test Examination. While section Enthusiastic which was not exposed to multimedia showed little increase of their achievement rate.

This is an indication indicates that students were able to comprehend what was taught at school. The teaching-learning process becomes more exciting for them. This implies that the use of multimedia as classroom strategic approach increased the academic performance of the students in Araling Panlipunan 8.



CONCLUSION

In conclusion, integrating multimedia into the teaching and learning process increases the student's learning. Adoption of such multimedia is highly effective. As such, the use of multimedia technology and project are an innovative and effective teaching and learning strategy because it motivate the students in their learning process. As evidenced by this research, students became very active participants in the teaching- learning process instead being passive learners. The experimental group got a higher gain scores between pretest and post-test than students who do not have access to the new multimedia material (control group). The findings showed that there is a significant difference on the academic performance of the student before and after the intervention. Thus, the null hypothesis is rejected. It is therefore recommended that in-service teachers in the academe will utilize the use of ICT in their classroom particularly in the teaching-learning process to enhance the motivation of the students in the class.

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The Influence Modified Klithik Puppet Media toward Speech Skill of Children with Autism

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Abstract

A speech skill was an ability in expressing either thought, idea or feeling the needs for the listener. Children with autism had lateness in speaking which is appeared in his speech rigid and monotone, talked to himself, and repeated the cut of song lyric. Autism is a complex neurobiological disorder that affect mainly on social communication and behavior. Therefore, to develop the speech skill of children with autism it had been used short dialog with modified klithik puppet media. Klithik puppet is one of the Indonesian traditional puppet. This research aim to analyze whether there was influence of modified klithik puppet media toward speech skill to children with autism in YBPK Semampir Elementary School in Kediri City, Indonesia. The kind of research used was pre-experiment. The design used one group pre test and post test. The method used to collect the data was test method. For the data analysis this research used analysis technique of statistic non parametric with wilcoxon match pairs test. The research result is after using modified klithik puppet media indicated that Zcount = 2,20 > Ztable = 1,96 this showed "there was significant influence of modified klithik puppet media toward speech skill of children with autism"

Keywords: *Children with Autism, Modified Klithik Puppet, Speech Skill*

Introduction

Language is a means of communication. Through individual language can convey ideas, thoughts, and feelings to others, both orally and in writing. The more skilled a person speaks, the brighter and clearer the mind. Talking plays an important role in human life, because the main purpose of speaking is communication. Communication is needed to live life as a social being. Language skills have four components: listening skills, speaking skills, reading skills, and writing skills (Nida & Haris, in Tarigan, 2008: 1). One of the language skills is talking. Speaking is an ability to pronounce articulation sounds or words to express, express or convey thoughts, ideas and feelings. Speaking is a tool to communicate ideas that are developed and developed in accordance with the needs of listeners or listeners (Tarigan, 2008: 16).

The development of speech in normal children, according to Hurlock (2003: 152), at the end of childhood that is at the age of 6-12 years. Mistakes in pronunciation are fewer words at this age than before. A new word is possible when first used, improperly pronounced, but after several times hearing the correct pronunciation, the child is able to

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pronounce it correctly (Hurlock, 2003: 152). In contrast to children with autism who experience speech disorders.

Etymologically the word "autism" comes from the words "auto" and "ism". Auto means self, while isme means a flow or understand. Thus autism is defined as a notion that is only interested in his own world. His behavior arises solely because of his inner drive. According to Sutadi, (in Yosfan, 2005: 15) explains that autism is a severe nerobiological developmental disorder that affects the way a person communicates and relates to others. Approximately 50% of children with autism experience delays in language development and speaking. Children with autism also often do not understand the words addressed to them. Often talking to yourself, and repeating chunks of songs or television commercials and saying them in an inappropriate atmosphere (Yosfan, 2005: 28).

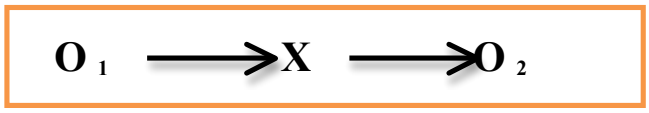
One effort to develop speech skills in children with autism is to use modified wayang klithik as a medium for short dialogue. Meanwhile, wayang klithik is a puppet made of flat wood. Unlike other puppets, wayang klithik has a handle made of wood (Lukman, 2011: 28). In this study the modified wayang klithik puppet is a form that not only resembles the shadow puppets of purwa, in which the kings crown and wear praba, but in the form of boys and girls adapted to the present, more attractive colors and arms or hands Made of cardboard. With the modified wayang klithik media, it is expected that the child can develop speaking skills by introducing the child's identity through question and answer to the teacher and other children with simple sentences. This study uses modified wayang klithik media to autistic children's speaking skills in SD YBPK Semampir Kediri

Literature Review

TAMBAHKAN KAJIAN PUSTAKA SEDIKIT SAJA

Method

This research was conducted with quantitative approach, as well as experimental research method with pre-experimental design. This research uses One-Group Pre-Posttest Design research design. The study design *one group pre test - post-test* can be described as follows (Sugiyono, 2010: 75) :



Information:

O1 : Pre-tests are performed on a mild autistic child to know the speaking skills before treatment is given. Pre-tests are performed by the child's answer and ask questions about the child's identity.

X : Activities undertaken to treat children with mild autism in speech skills through modified modified wayang media.

O2 : Post-tests performed on a mild autistic child to know the speaking skill after treatment.

Tests done as much as 2 meetings before and after the administration of *treatment* in children with autism mild conversational skills in SD YBPK Semampir Kediri.*Treament* or treatment given as much as 10 times. At the end of the treatment given oral test made by the teacher according to the given material that is answering and asking about identity. The sample of this study as many as 6 students with the same characteristics in the part of the

plants. The dependent variable in this research is speaking skills in SD YBPK Semampir Kediri, while the independent variable is modified wayang klithik media.

1. *Data Collection Techniques*
   In this study the test technique. The test method is used to obtain the learning result data in the child before the treatment is given and after the treatment is given. The tests used were two pre-tests used to assess the initial ability of the autistic child before treatment, and post-tests used to determine the speaking skills of an autistic child after treatment.Problems used on pre-tests and post-tests are oral tests about introducing self-identities.
2. *Data Analysis Technique*
   Data analysis technique used in this research is nonparametric statistical data analysis technique. By using statistical analysis with the Wilcoxon formula. The formula used is:

$$z = \frac{T - \mu_T}{\sigma_T}$$

Information:
Z : The value of statistical test results *match pairs Wilcoxon test*
X : The number of levels / rank is small
μ_T : Mean = $\frac{n\,(n+1)}{4}$
σ_T : Standar deviation = $\sqrt{\frac{n\,(n+1)(2n+1)}{24}}$
n : number of samples

Findings/Analysis

a. *Pre Test Results Data on Autistic Children Speaking Skills*
   Pre test is the test given before the teaching begins this aims to find out where the autistic child speaking skills (ask and answer questions about the identity of the child).This assessment is taken before the child gets treatment using modified wayang klithik media. During pre test the child is asked to ask questions and answer questions from the researcher about the child's identity (name, age, address, school, and class). The samples of the autistic children's study are shown in the following table:

Table 1.1
Pre test results of child speaking skills
Autism in YBPK Elementary School in Semampir Kediri

No.	Name	Answer the question	Asking	Value
1.	MR	5	10	50
2.	AD	5	5	33.3
3.	RD	5	8	43.3
4.	DA	5	8	43.3
5.	RA	5	9	46.6
6.	TD	5	10	50
Average value				266.5: 6 = 44.4

b. *Post- Test Result on Autistic Child Speech Skills*
Test post test results were obtained from tests performed after the children were treated as described in the following table:

Table 1.2
Post test results of children's speaking skills
Autism in YBPK Elementary School in Semampir Kediri

No	Name	Answer the question	Asking	Value
1	MR	11	12	76.6
2	AD	7	7	46.6
3	RD	10	10	66.6
4	DA	10	11	70
5	RA	11	12	76.6
6	TD	11	13	80
Average value				416.4: 6 = 69.4

c. *Recapitulation of Pre Test Results and Post Test Results*
Recapitulation is intended to determine the ratio of speech skill level before treatment is given and after treatment is given. So that can be known whether or not the influence of learning using media modified wayang klithik against autistic children's speaking skills in SD YBPK Semampir Kediri. Based on the test results, the data obtained pre test post-test results With the following recapitulation:

Table 1.3
Recapitulation of pre test results And post test
Autistic child speaking skills
In YBPK Elementary School in Semampir Kediri

No	Sample Name	Pre Test	Test Post
1	MR	50	76.6
2	AD	33.3	46.6
3	RD	43.3	66.6
4	DA	43.3	70
5	RA	46.6	76.6
6	TD	50	80
Average value		44.4	69.4

d. *Results Data Analysis of Speech Skills*
At this stage the researchers carefully analyze the data that has been collected with the aim to answer the problem as well as testing the hypothesis. The data were analyzed using non-parametric statistical formula *Wilcoxon Match Pairs Test.*

1. Creating work table changes in the value of speech skills for children with autism in SD YBPK Semampir Kediri. The change of value can be seen in table 4.3:

Table 1.4
Working Table Change in Pre-Test and Test Post Value
Autistic Child Speaking Skills at SD YBPK Semampir Kediri

No	X_{A1}	X_{B2}	Different	Signs Level		
			$X_{B2} - X_{A1}$	Level	+	-
1.	50	76.6	+26,6	3.0	3.0	0
2.	33.3	46.6	+13.3	1.0	1.0	0
3.	43.3	66.6	+23.3	2.0	2.0	0
4.	43.3	70	+26,7	4.0	4.0	0
5.	46.6	76.6	+30	5.5	5.5	0
6.	50	80	+30	5.5	5.5	0
amount					T = 21	0

2. Statistical calculations with formulas used to analyze the types of non-parametric statistical *Wilcoxon Match Pairs Test.*

The data in the form of research results *pretest* and *posttest* values that have been included in the table above data analysis work, then analyzed using *the Wilcoxon Match Pairs Test formula:*

$$z = \frac{T - \mu_T}{\sigma_T}$$

Information:
Z : The value of statistical test results *match pairs Wilcoxon test*
X : The number of levels / rank is small
μ_T : Mean = $\frac{n(n+1)}{4}$
σ_T : Standar deviation = $\sqrt{\frac{n(n+1)(2n+1)}{24}}$
n : number of samples

The data acquisition as follows: given n = 6 and 5% error rate, are as follows:

1. Looking for number of levels. (See table 1.3). So T = 0
2. Looking for value $\mu_T = \frac{n(n+1)}{4}$

$$= \frac{6(6+1)}{4}$$

$$= \frac{42}{4}$$

$$= 10.5$$

3. Looking for value $\sigma_T = \sqrt{\frac{n(n+1)(2n+1)}{24}}$

$$= \sqrt{\frac{6(6+1)(2.6+1)}{24}}$$

$$= \sqrt{\frac{6.7.13}{24}}$$

$$= \sqrt{\frac{546}{24}}$$
$$= \sqrt{22,75}$$
$$= 4,77$$

4. After obtaining the mean and standard deviation results, the results are included in the formula

$$z = \frac{T - \mu_T}{\sigma_T}$$

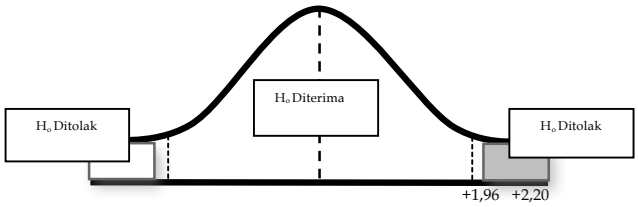
$$z = \frac{0 - 10,5}{4,77}$$

$$z = -2,20$$

Calculation of analysis results with wilcoxon with crisis value 5% decision making using two-sided test α 5% = 1.96 are:
H_a accepted if Zhitung> 1.96 Ztabel
H_o accepted if Zhitung <Ztabel 1.96

e. Data Interpretation

To prove the working hypothesis (Ha) which reads "there is influence of wayang media klithik modification to autistic children speech skill in SD YBPK Semampir Kediri" is accepted or rejected, hence result of research need to be compared with critical value. The way is to compare the value of the table with the count value contained on the curve of two-sided test .. The critical value for α = 5% with the provision critical value = ± Z ½ α = ± 1.96. Here is a comparison of two-sided test curve with table value and calculated value:



The results of the above data analysis show that Zh = 2.20 (value (-) not taken into account because the absolute price) is greater than the value of Z table with a critical value of 5% (for two-sided test) = 1.96 a fact that the value of Z obtained In the count is 2.20 is greater than the critical value of Ztabel 5% is 1.96 (Zh> Zt) so Ho is rejected and Ha accepted. This means "there is influence of wayang media klithik modification to autistic children speech skills at SD YBPK Semampir Kediri".

Most autistic children experience delays in speaking, speaking is the activity of conveying ideas and ideas in spoken language, in accordance with the opinion of Tarigan (2008: 16), speaking is the ability to say articulation sounds or words to express thoughts, ideas and feelings, It is to develop autistic speech skills of the authors provide treatment or treatment with a short dialogue meeting Tino and Tini using media modified wayang klithik and plugged it on safana (aspak). Media is a learning resource or physical vehicle containing instructional materials in the student environment that can stimulate students to learn

(Arsyad, 2010: 3-4), while wayang klithik is a wooden puppet that is flat two-dimensional (Lukman, 2011: 28) .

At the time after the medium of modified wayang klithik media, the child is able to obey the instructions or instructions given, the child is more interested in the given lesson, the child can answer questions about his / her identity, and ask his / her friend about the identity of his / her friend. The ability of autistic children in speaking skills that include (name, age, address, school, class) gets better. In accordance with the opinion of Arsyad (2010: 25) which states that the benefits of learning media can improve and direct the attention of children so that it can lead to learning motivation, more direct interaction between students and the environment, and the possibility of students to learn individually in accordance with the ability and interest.

The result of the research shows that the result of final observation / post test using modified wayang klithik media on autistic children speech skill shows significant improvement. It is shown from result of calculation analysis of Zh = 2,20 bigger than Z table. The ability to speak autistic children increased because the researchers gave a short dialogue using the medium of modified clod modified wayang and before the treatment done researchers invite children to sing earlier. The researcher arranged the space of the previous source, thus making the atmosphere comfortable and the child becoming interested in learning. This shows that every learning, children need learning that can attract the attention of children so that when given the child's learning can understand the material being taught. In accordance with the opinion of Shah (2011: 133), a teacher in conveying learning materials requires an approach, strategy, technique or learning that can improve learning outcomes of children and facilitate children in understanding the lessons delivered.

Recommendation

There is influence of wayang media klithik modification to autistic children speech skills in SD YBPK Semampir Kediri. Based on research about the influence of wayang media klithik modification of autistic children's speaking skills in SD YBPK Semampir Kediri, researchers put forward some suggestions as follows:

a. For teachers Benefits of instructional media can improve and direct the attention of the child so that it can lead to learning motivation, more direct interaction between students and the environment, and the possibility of students to learn independently according to their abilities and interests. Therefore, teachers should be able to develop more creative media to develop the ability of autistic children not in the field of speaking skills alone
b. In the researcher In other researchers should if want to conduct a similar or advanced research, it is suggested to be deepened and expanded and can complement the lack of this research. It is hoped other researchers can develop the potential of other autistic children.

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Determinants of Career Choices of Freshmen Students of the Department of Technology Teacher Education, College of Education, MSU- Iligan Institute of Technology

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Abstract

This study aimed to determine the career choice determinants of the freshmen DTTE students. A questionnaire was developed to examine the personal profile of the students, their career choice determinants and the reasons influencing their choice of career. The questionnaire was distributed and completed by 77 students from Industrial Technology, Drafting Technology and Technology and Livelihood Education from the Department of Technology Teacher Education of the College of Education, MSU-IIT.

The researchers used the descriptive method. Data were gathered in the present condition that was to find out what are the perceptions of the respondents upon choosing their respective courses.

The data was statistically treated using the frequency and percentage, mean and standard deviation for the reasons and the determinants of the career choice of the respondents. Person product moment correlation was used to correlate the personal profile of the respondents to the determinants of the career choice.

The findings revealed that majority of the respondents were 17 years old and 56 of them were female. The outcome of the study showed that the respondents' choice of career is based on their interest on the course and the course that is offered by the school. The determinants of the career choice were moderately influenced in choosing a career having an average mean of 2.05.

It was also found out that only Sex is observed to have a significant relationship with the following career choice determinants: (a) High School Intervention, (b) High School Teacher Encouragement and (c) High School Classmates/ Close Friends Encouragement. Not all of the determinants of the career choice came out to influence the respondents' choice of career.

Keywords: *Career Choice, Career Choice Determinants, Career Choice Influence, Freshmen Encouragement, Freshmen Motivation, Preferred Courses*

Introduction/Problem

Attaining a professional degree is a will and choice, but if this will not be planned well, it would result to an ineffective and unproductive life. It all starts at choosing a college course.

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Choosing a college course for some is easy; some people know exactly what they want to be when they grow up. For others, choosing college course is probably one of the hardest decisions they will make in their life. It does not help that there are many college courses and college programs now among which one has to choose. There are various individuals who are undecided about what they will become after graduation, as they do not properly plan on their choice of career. Without planning properly, a future of a person has no direction. It will also be difficult to find the job he wants in the future. Choosing a career properly motives and drives one to accomplish our goals and dreams.

According to McQuerrey (2016), choosing a career path can help a person set professional goals and develop a strategy for getting where an individual wants to be. Part of choosing an appropriate career path involves making an honest self- evaluation of talents, abilities and interests. While elements of a person's path may change over time due to choice or circumstance, having an overall professional objective guides a being in making critical decisions with greater clarity.

According to Brown (2013), things cannot be predicted. The fact was frustrations and fear most of the people feel. Things simply are not as predictable as they once were when it comes to plotting out a superior and satisfying career. It is pretty scary when a person cannot plan and control the way to secure his future. It is not easy to decide what is better for the future. Every person has his basis of what he wants tobe.

The importance of this study pinpoints information about the upcoming freshmen students of the Department of Technology Teacher Education (DTTE), College of Education about the possible factors or reasons that may affect their choice in choosing a career and for them to choose the best profession to take in college regarding their passion and capabilities. The results will be given value since this will help the DTTE freshmen students in their choice of career base on the factors that influence the students.

The study aimed to determine the influence of some factors on the career choices of freshmen students from Department of Technology Teacher Education, College of Education, Mindanao State University- Iligan Institute of Technology. Specifically, it sought to answer the following questions:(1) What is the profile of the respondents in terms of Person- Related Factors which are Age, Sex, Course & Major, (SASE) Score, Parent's Monthly Income, Parent's Educational Attainment, Parent's Occupation, and the Type of Previous High School (2) What are the reasons for the career choice of the respondents? (3) How do the respondents perceived the following career choice determinants which are Self- Awareness, Parent's Encouragement, Previous High School Intervention, High School Teacher Encouragement, High School Classmates/ Close Friend's Encouragement, Community Organization Encouragement, and Affiliation of the Church Organization (4) Is there a significant relationship between the Profile of the Respondents and the Career Choice Determinants?

Design/ Procedure

The researchers used the descriptive method. The researchers used description method for the reason that the researchers get the information about the respondents profile and to determine the factors which affects their decision making in choosing a course. Data were gathered in the present condition that was to find out what are the perceptions of the respondents upon choosing their respective courses. The instrument used in gathering the data was the non-standardized questionnaire or the researcher-made questionnaire in a form of checklist. The questionnaire has three parts. The first part comprises the personal background

of the respondents. The second part comprises the seven career choice determinants together with their corresponding questions. The respondents answered strongly agree, agree, disagree, or strongly disagree. The third part of the questionnaire comprises the possible reason in choosing their career. The respondents answered by checking the reasons of their career choice.

Findings/ Analysis

Profile of the respondents in terms of the following:

a. Age

Figure 3 Frequency and Percentage Distribution ofthe Respondents in Terms of Age

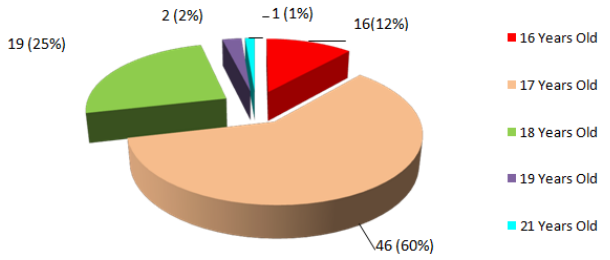

Figure 3 shows the frequency and the percentage distribution of respondents according to their age. As depicted in the table above, among the 77 respondents, there are 46 or 60% of the total respondents who are 17 years old which has the highest number of responses and there is only 1 or 1% of the total respondents who is 21 years old which has the lowest number of responses. It can be ascertained that the majority of the respondents are 17 years old who are in adolescence stage.

b. Sex

Figure 4 Frequency and Percentage Distribution of Respondents in Terms of Sex

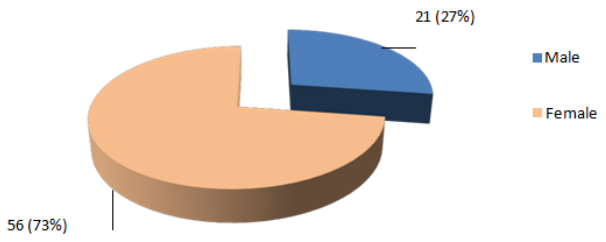

Figure 4 shows the frequency and percentage distribution of respondents in terms of sex. Among the 77 respondents, 56 or 73% are female and 21 or 27% are male. This shows that majority of the respondents are female.

c. Course Major

Figure 5 Frequency and Percentage Distribution of Respondents in Terms of Course & Major

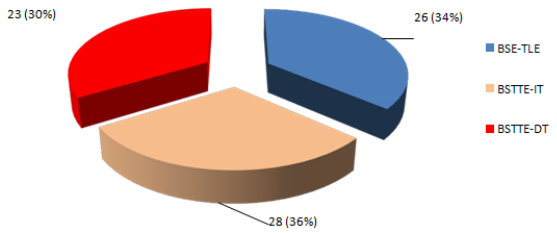

Figure 5 shows the frequency and percentage distribution of respondents in terms of their course and major. As shown on the table above, that 28 or 36% of the total respondents are from BSTTE-IT which has the highest total of responses and
23 or 30% of the respondents are from BSTTE-DT which has the lowest total number of responses. This shows that the majority of the respondents are BSTTE-IT students.

d. (SASE)Score

Figure 6 Frequency and Percentage Distribution of Respondents in Terms of Course & Major

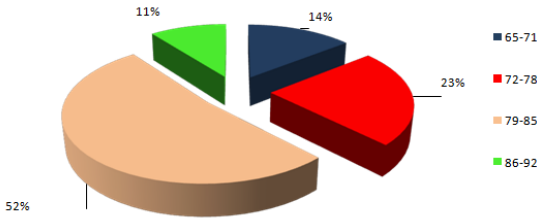

Figure 6 shows the frequency and the percentage distribution of the respondents according to their SASE Score. The figure above shows that, out of the 77 respondents, majority of their scores is range from (79-85) while the highest SASE score that the respondents got was in the range of (86-92).

e. Parent's Monthly Income

Figure 7 Frequency and Percentage Distribution of Respondents in Terms of Parents' Monthly Income

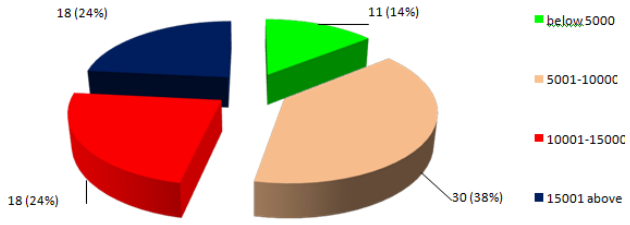

Figure 7 shows the frequency and percentage distribution of Parents' Monthly Income. Based on the figure above, out of 77 respondents, 30 or 38% of the total respondents have a Parent's Monthly Income of P5001-10000 which has the highest number of responses and only 11 or 14% of the total of respondents have a Parent's Monthly Income of below P5000 which has the lowest number of responses. It is clear that the majority of the respondents' Parent's Monthly Income ranges from P5001-10000 which constitutes 38% of the total number of respondents.

f. Parent's Educational Attainment

Figure 8 Frequency and Percentage Distribution of Respondents in Terms of Father's Educational Attainment

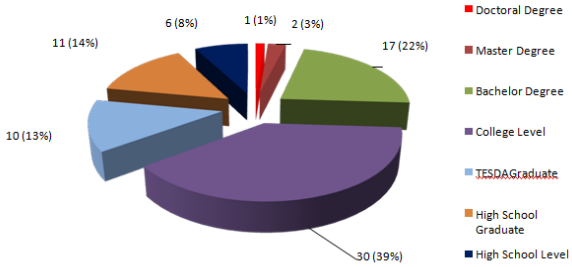

Figure 8 shows the frequency and percentage distribution of Father's Educational Attainment. Based on the figure above, out of 77 respondents, 30 or 39% of the total respondents attained College Level in terms of father's educational attainment which has the highest number of responses and only 1 or 1% of the total respondents' attained Doctoral Degree which has the lowest number of responses in father's educational attainment. It shows that the majority of the respondents' Father's educational attainment is College Level which constitutes 39% of the total number of respondents.

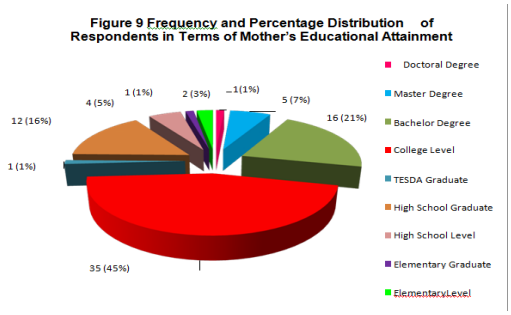

Figure 9 shows the frequency and percentage distribution of Mother's Educational Attainment. Based on the figure above, out of 77 respondents, 35 or 45% of the total respondents' attained College Level in terms of mother's educational attainment which has the highest number of responses and it can be observe that there is 1 or 1% of the total respondents' attained Doctoral Degree, Master's Degree and Elementary Graduate which has the lowest number of responses in mother's educational attainment. It is clear that the majority of Mother's educational attainment of the respondents is College Level which constitutes 45% of the total number of respondents.

g. Parent's Occupation

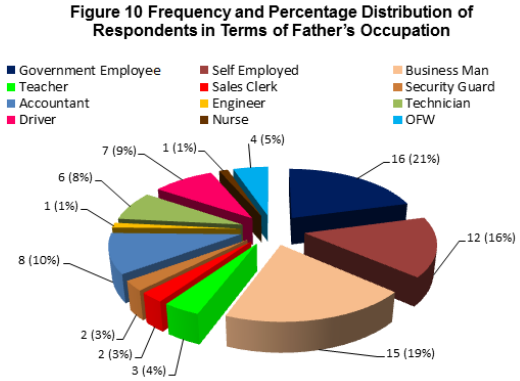

Figure 10 shows the frequency and percentage distribution of Father's Occupation. As shown on the figure above, of 77 respondents, 16 or 21% of the total respondents' father's occupation is Government Employee which has the highest number of responses while it can be observe that there is 1 or 1% of the total respondents' father's occupation are Nurse and Engineer which has the lowest number of responses. It is clear that the majority of the respondents' father's occupation is Government Employee which constitutes 21% out of the total of the respondents.

Figure 11 Frequency and Percentage Distribution of Respondents in Terms of Mother's Occupation

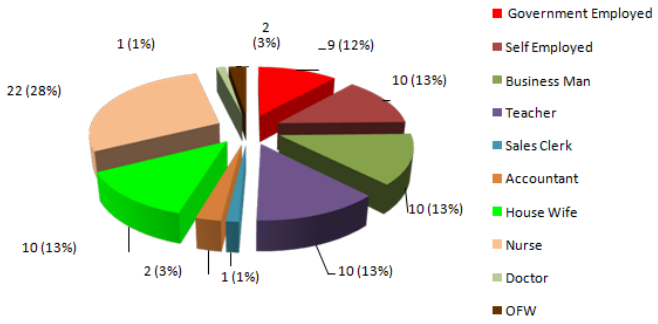

Figure 11 shows the frequency and percentage distribution of Mother's Occupation. It is shown on the figure above, that of 77 respondents, 22 or 28% of the total respondents' mother's occupation is Nurse which has the highest number of responses, and it can also be observe only 1 or 1% of the respondents' mother's occupation are Doctor and Sales Clerk which has the lowest number of. It is clear that the majority of the respondents' mother's occupation is Nurse which constitutes 28% out of the total of the respondents.

h. Type of Previous High School

Figure 12 Frequency and Percentage Distribution of the Respondents in Terms of their Previous High School

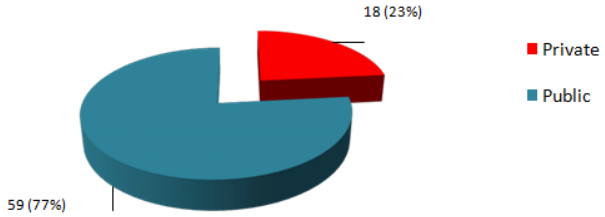

Figure 12 shows the frequency and percentage distribution of the respondents Previous High School. As depicted on the figure above, out of 77 respondents, it is clear that 59 or majority of the respondents came from Public high school which constitutes 77% out of the total respondents which has the highest number of response while only 18 or 23% came from Private high school.

Table 3. Reasons for the career choice of the respondents

Reasons in choosing the current course (9 Reasons)	Number of Responses (77Respondents)
Interested with the Course	3
Offered by the School	3
Out of Slot	3
Low SASE score	2
Financial Reasons	1
Parents Demand	9
Others (Please Specify):	1
Total	**146/693** (**9** reasons X**77** respondents)

Legend: Numbers (right side) indicates the total responses of the respondents in each reason

The table 3 shows that out of 9 reasons, the most reason of the respondents in choosing the current course is: they are interested with the course and it was offered by the school with a total response of 32 in each reason.

This result was supported by the Strang (2014) that 97% of students who responded to their recent survey indicated that, as a whole, they found their college courses interesting.

Respondents perceive the following career choice determinants:

Summary Table of the Career Choice Determinants

Career Choice Determinants	Mean	SD	Interpretation	Description
Self- Awareness	1.81	0.678	Disagree	Moderately Aware
Parents Encouragement	1.87	0.696	Disagree	Moderately Encouraged
Previous High School Intervention	1.84	0.713	Disagree	Moderately Intervened
High School Teacher Encouragement	2.01	0.69	Disagree	Moderately Encouraged
High School Classmates/ Close Friends Encouragement	2.22	0.753	Disagree	Moderately Encouraged
Community Encouragement	2.35	0.653	Disagree	Moderately Encouraged
Affiliation of Church Organization	2.29	0.697	Disagree	Moderately Guided
Average Mean	**2.05**	**0.697**	**Disagree**	**Moderately Influenced**

Table11 shows the results on the Summary Table of the Career Choice Determinants. Based from the average mean of (2.05), the respondents were moderately influenced by the Career Choice Determinants.

This result was supported by Borchert(2002), there are multiple ways to approach our interests; everyone is an individual with their own way of doing things. This brings into the discussion the statement made in the literature that only the student can decide what is best for them. Students must remember that while there are an infinite number of resources

available for research, they must decide for themselves what works for them. The student can use all the tools available, but it is the make- up of the student's personality, drive, ambition, and creativity that synthesize the effort into success.

Is there a significant relationship between career choice determinants of the freshmen students from DTTE to their profile?

Relationship between the Profile of the Respondents to the High School Interventions

High School Intervention			
Personal Profile	**r**	**p**	**Remarks**
Age	.196	0.087	Not Significant
Sex	-.227	0.047	Significant
Course	-.180	0.117	Not Significant
SASE	.211	0.065	Not Significant
Parents' Monthly Income	.092	0.425	Not Significant
Fathers' Educational Attainment	.147	0.202	Not Significant
Mothers' Educational Attainment	.111	0.337	Not Significant
Fathers' Occupation	-.078	0.498	Not Significant
Mothers' Occupation	-.054	0.640	Not Significant
Type of Previous High School	-.069	0.550	Not Significant

High School Intervention

Age (r= .196, p=.087). It registered negatively negligible relationship. It has no significant correlation with high school intervention. It implies that age does not influence the career choice of the freshmen students.
Sex (r=-.227, p=.047). It registered negatively negligible relationship. It has significant correlation with high school intervention. It implies that sex does influence the career choice of the freshmen students. This result was supported by Benenson et al. (1997) as cited by Baerveldt et.al. (2014), it has been frequently found that girls tend to interact in small groups, whereas boys tend to interact in larger groups.
Course (r=-.180, p=.117). It registered negatively negligible relationship. It has no significant correlation with high school intervention. It implies that course does not influence the career choice of the freshmen students.

SASE (r=.211, p=.065). It registered no value relationship. It has no significant correlation with high school intervention. It implies that SASE scores does not influence the career choice of the freshmen students.
Parent's Monthly Income (r=.092, p=.425). It registered negatively negligible relationship. It has no significant correlation with high school intervention. It implies that parent's monthly income does not influence the career choice of the freshmen students.
Father's Educational Attainment (r=.147, p=.202) it registered no value relationship. It has no significant correlation with high school intervention. It implies that father's educational

attainment does not influence the career choice of the freshmen students.

Mother's Educational Attainment (r=.111, p=.337). It registered negatively negligible relationship. It has no significant correlation with high school intervention. It implies that mother's educational attainment does not influence the career choice of the freshmen students.

Father's Occupation (r=-.078, p=.498). It registered no value relationship. It has no significant correlation with high school intervention. It implies that father's occupation does not influence the career choice of the freshmen students.

Mother's Occupation (r=-.054, p=.640). It registered negatively negligible relationship. It has no significant correlation with high school intervention. It implies that the mother's occupation does not influence the career choice of the freshmen students.

Type of Previous High School (r=-.069, p=.550). It registered no value relationship. It has no significant correlation with high school intervention. It implies that the type of previous high school does not influence the career choice of the freshmen students.

Table 15.Relationship between the Profile of the Respondents to the High School Teacher Encouragement

High School Teachers Encouragement			
Personal Profile	r	P	**Remarks**
Age	.o74	0.524	Not Significant
Sex	-.232	0.042	Significant
Course	-.199	0.082	Not Significant
SASE	.177	0.124	Not Significant
Parents' Monthly Income	.039	0.736	Not Significant
Fathers' Educational Attainment	-.002	0.989	Not Significant
Mothers' Educational Attainment	.036	0.754	Not Significant
Fathers' Occupation	-.018	0.874	Not Significant
Mothers' Occupation	.o74	0.524	Not Significant
Type of Previous High School	.032	0.777	Not Significant

High School Teachers Encouragement

Age (r= .074, p=524). It registered positively negligible relationship. It has no significant correlation with the high school teacher encouragement. It implies that age does not influence the career choice of the freshmen students.

Sex (r= -.232, p=.042). It registered negatively negligible relationship. It has a significant correlation with the high school teacher encouragement. It implies that sex does influence the career choice of the freshmen students. This result was supported by Chudgar and Sankar (2008), that male and female teacher differs in terms of their classroom management practices and their

belief in students' learning ability. In partial support of the policy of hiring more female teachers, it also shows that being in a female teacher's classroom is advantageous for language learning but teacher gender has no effect on mathematics learning.

Course (r= -.199, p=.082). It registered negatively negligible relationship. It has no significant correlation with the high school teacher encouragement. It implies that course does not influence the career choice of the freshmen students.

SASE (r= .177, p=.124). It registered positively negligible relationship. It has no significant correlation with the high school teacher encouragement. It implies that SASE does not influence the career choice of the freshmen students.

Parents' Monthly Income (r= .039, p=.736). It registered positively negligible relationship. It has no significant correlation with the high school teacher encouragement. It implies that Parents' monthly income does not influence the career choice of the freshmen students.

Fathers' Educational Attainment (r= -.002, p=.989). It registered negatively negligible relationship. It has no significant correlation with the high school teacher encouragement. It implies that fathers' educational attainment does not influence the career choice of the freshmen students.

Mothers' Educational Attainment (r= .036, p=.754). It registered positively negligible relationship. It has no significant correlation with the high school teacher encouragement. It implies that mothers' educational attainment does not influence the career choice of the freshmen students.

Fathers' Occupation (r= -.018, p=.874). It registered negatively negligible relationship. It has no significant correlation with the high school teacher encouragement. It implies that fathers' occupation does not influence the career choice of the freshmen students.

Mothers' Occupation (r= .067, p=.560). It registered positively negligible relationship. It has no significant correlation with the high school teacher encouragement. It implies that mothers' occupation does not influence the career choice of the freshmen students.

Types of Previous High School (r= -.018, p=.874). It registered negatively negligible relationship. It has a significant correlation with the high school teacher encouragement. It implies that a type of previous high school does not influence the career choice of the freshmen students.

Table 16.Relationship between the Profile of the Respondents to the High School classmates/ close friend's Encouragement

High School classmates/ close friends Encouragement			
Personal Profile	**R**	**p**	**Remarks**
Age	.o74	0.524	Not Significant
Sex	-.232	0.042	Significant
Course	-.199	0.082	Not Significant
SASE	.177	0.124	Not Significant
Parents' Monthly Income	.039	0.736	Not Significant
Fathers' Educational Attainment	-.002	0.989	Not Significant
Mothers' Educational Attainment	.036	0.754	Not Significant
Fathers' Occupation	-.018	0.874	Not Significant
Mothers' Occupation	.o74	0.524	Not Significant
Type of Previous High School	-.069	0.550	Not Significant

High School classmates/Close friends Encouragement

Age (r= .102, p=.377). It registered positively negligible relationship. It has no significant correlation with the high school classmates/close friends' encouragement. It implies that age does not influence the career choice of the freshmen students.
Sex (r= -.261, p=.022). It registered negatively negligible relationship. It has significant correlation with the high school classmates/close friends' encouragement. It implies that sex does influence the career choice of the freshmen students. This result was supported by Rubin et al. (2006) as cited by Baerveldt et al. (2014), First of all, girls are mainly befriended with girls and boys with boys. According to Benenson et al. (1997) as cited by Baerveldt et al. (2014), it has been frequently found out that girls tend to interact in small groups, whereas boys tend to interact in larger groups.
Course (r= -.071, p=.541). It registered positively negligible relationship. It has no significant correlation with the high school classmates/close friends' encouragement. It implies that course does not influence the career choice of the freshmenstudents.
SASE (r= .142, p=.218). It registered positively negligible relationship. It has no significant correlation with the high school classmates/close friends' encouragement. It implies that SASE does not influence the career choice of the freshmen students.
Parents' Monthly Income (r= .129, p=.265). It registered positively negligible relationship. It has no significant correlation with the high school classmates/close friends' encouragement. It implies that parents' monthly income does not influence the career choice of the freshmen students.
Fathers' Educational Attainment (r= .005, p=.964). It registered positively negligible relationship. It has no significant correlation with the high school classmates/close friends' encouragement. It implies that fathers' educational attainment does not influence the career choice of the freshmen students.
Mothers' Educational Attainment (r= .048, p=.681). It registered positively negligible relationship. It has no significant correlation with the high school classmates/close friends'

encouragement. It implies that mothers' educational attainment does not influence the career choice of the freshmen students.

Fathers' Occupation (r= .107, p=.355). It registered positively negligible relationship. It has no significant correlation with the high school classmates/close friends' encouragement. It implies that fathers' occupation does not influence the career choice of the freshmen students.

Mothers' Occupation (r= .124, p=.281). It registered positively negligible relationship. It has no significant correlation with the high school classmates/close friends' encouragement. It implies that mothers' occupation does not influence the career choice of the freshmen students.

Type of Previous High School (r= -.065, p=.577). It registered negatively negligible relationship. It has no significant correlation with the high school classmates/close friends' encouragement. It implies that type of previous high school does not influence the career choice of the freshmen students.

Conclusions

Based on the findings of the study, the following conclusions are drawn:

1. The respondents' choice of career is based on their interest on the course and the course that is offered by the school.
2. The freshmen students from the Department of Technology Teacher Education were moderately influenced by the career choice determinants used in the study.
3. Only Sex is observed to have a significant relationship with the following career choice determinants: (a) High School Intervention, (b) High School Teacher Encouragement and (c) High School Classmates/ Close Friends Encouragement. Thereby, the null hypothesis stating that there is no significant relationship between the profile of the respondents to the career choice determinants is partially rejected.

Recommendations

Based on the findings and the conclusion of this study, the following recommendations are drawn:

1. *Interest of the course* and *the course offered by the school* are the most reasons of the respondents choice of career. However students are still unfamiliar if the course they will be taking is compatible for them. Thereby the researchers recommend creating a policy in which the institute must conduct an assessment to their upcoming enrollees to evaluate them if they are compatible to their desired courses.
2. The future researchers recommend in finding new set of determinants that will support in determining the respondents' career choice.
3. It is recommended that high school programs on choosing a career should be directed properly as well as sustained in focusing gender preferences.
4. Similar study should be conducted to include other factors and parameters that will be applied in a larger scope that will help and guide more students in determining their career choice.
5. The researchers recommend conducting further study with the junior and senior high school students as respondents to conform with the K-12 program career tracking.

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Lecturers' Observations of a Lesson Study Approach and Open Class Workshop held at the Central University of Technology in South Africa

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Abstract

This paper highlights observations made by two lecturing staff members during a practical demonstration of a Lesson Study workshop held at the Central University of Technology (CUT), South Africa. Lesson Study provides an opportunity for teachers to benefit from one another's pedagogical knowledge. A challenge for South African teachers in general, is to move from traditional orientated teaching methods to more collaborative approaches to teaching and learning- this we argue may improve the teaching and learning of Mathematics and to enhance learners' performance. In total, 78 participants from various constituencies (Faculty of Humanities, Central University of Technology, Teachers' unions, officials' of the Free State Department of Education, Non-government organisations, the University of the Free State, the University of Witwatersrand, Sol Plaatje University and Foundation phase educators from selected schools in the Motheo educational district) attended the Lesson Study Workshop. Through a collaborative effort between the Thai facilitators, teacher and CUT University lecturing staff, planning was done for a practical demonstration of an open Lesson Study approach, administered to a grade three class. A qualitative research technique via the use of video recordings was employed to observe, analyse and reflect upon the Lesson Study approach and open class session. A key observation revealed the following: the expert facilitator conveyed useful knowledge on the Lesson Study approach to participants; the grade three class teacher demonstrated adequate understanding and application of pre Lesson Study planning principles and the open class audience being enticed by the Lesson Study approach. From our observations and reflections on the workshop, the Lesson Study approach to teaching and the open class session could be applied in the South African school context to enhance teachers' pedagogical knowledge, professional development competencies and improve learners' performance in Mathematics.

Keywords: *Lesson Study approach; lecturer observations, open class session*

Introduction/Problem

Despite the majority of South African learners enjoying above-average levels of public and private education resources, their performance in Mathematics, on both regional and international tests, has been found to be extremely weak (Moloi & Chetty, 2011). The teacher's role in teaching and learning is identified as a common and necessary factor in addressing this poor performance (Even & Tirosh, 2008; Schoenfeld, 2011), with the

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teacher's knowledge being one of the most important variables that impact on what is done in the classroom (Fennema & Franke, 1992; Turner-Bisset, 2001). In what follows, many questions such as:

What can be done to improve learners' performance in Mathematics? Which other relevant practices in other countries, including the literature related to Mathematics teaching in the Foundation Phase can be used to develop mathematics teachers?

Various scholars argue that specific teaching approaches appear to be needed in improving learner performance in Mathematics classes. Lesson Study (with its origins from the Japanese elementary education), as an approach to teaching and learning is geared at improvement and the knowledge building process in Mathematics (Hiebert, Gallimore, & Stigler, 2002). Furthermore, these scholars confirm that in the Japanese Lesson Study, teachers work in small teams to plan, teach, observe, analyse, and refine individual class lessons, called research lessons. Research lessons are published and widely disseminated throughout the country. The Japanese Lesson Study is a broad-based, teacher-led system for improvement of teaching and learning (Hiebert, Gallimore, & Stigler, 2002).

In this article, we highlight observations made by two lecturing staff members during a practical demonstration of a Lesson Study workshop held at the Central University of Technology (CUT), South Africa. The practical demonstration of an open approach Lesson Study during the Open Class session, was preceded by an introduction on the Lesson Study and Open approach to learning- this was done by the facilitator, Prof. Dr. Maitree Inprasitha. During the Open Class session workshop, the facilitator introduced the rules for observing a Lesson Study class (Open approach). For the Open Class demonstration, he articulated the following aspects, to be observed by workshop participants, namely: collaborative problem solving; learner ideas emerging from the lesson presented by the teacher and allowing time for learners' ideas to come out. In the final session of the workshop, the facilitator (Prof. Dr. Maitree Inprasitha) further requested participants to reflect and discuss their observations, especially those issues relating to the above mentioned three aspects. An interactive session followed between Prof. Dr. Inprasitha and workshop participants.

Purpose of the study and Research Question

This paper report on lecturer observations of a Lesson Study approach and the practical demonstration of an Open Class session at the Central University of Technology.
The paper was guided by the following research question:

- *What is the value of a Lesson Study approach, administered during an Open Class session in promoting teachers' pedagogical knowledge and learners understanding of certain Mathematical concepts?*

Literature review

The system of Lesson Study in Japan is viewed by numerous teachers and scholars as largely responsible for the high-quality teaching in grades 1 to 8 classrooms (Lewis & Tsuchida, 1997; Shimahara & Sakai, 1995; Stigler & Hiebert, 1999). The Japanese education authorities provide considerable support for the Lesson Study approach in improving

teaching. Lesson Study focuses directly on developing and refining annotated lesson plans (Wang-Iverson & Yoshida, 2005) using common assessments to gather relevant information (Stigler, 2010). Therefore, teachers who are familiar with Lesson Study seem to acquire more general skills, which they apply throughout their teaching (Lewis, 2002: Wang-Iverson & Yoshida, 2005).

Thailand has been implementing Lesson Study since 2002, largely through the efforts of Prof Dr Maitree Inprasitha. An adaptive feature of the said implementation process is to incorporate the Open Class session (Inprasitha, 2010). Teaching is a cultural activity (Stigler & Hiebert, 1999), hence when comparing the Lesson Study approach between Thailand and Japan, different cultural backgrounds and values come to the fore in the teaching of Mathematics. Inprasitha (2010) further also asserts that the implement Lesson Study and Open Approach in Thai schools, present some challenges. In South Africa, since 1999, Naruto University of Education, through a partnership with Hiroshima University, has participated in the Mpumalanga Secondary Science Initiative (MSSI)- this according to (Ono, Chikamori, Ozawa, & Kita, 2007; Ozawa, Ono, & Chikamori, 2010). The aim of the MSSI was to improve Mathematics and Science teaching through teacher retraining and the establish of provincial wide in-service training initiatives. MSSI was an "Experience-Sharing Model" in which exposure of group of individual's from developing countries to share relevant experience of Mathematics teaching with Japan. Furthermore, as a result of changes in national education curricula and/or policy, methods such as Lesson Study are now receiving attention as a strategy to enhance teachers' pedagogical knowledge, professional development competencies and improve learners' performance in Mathematics.

Lesson Study as defined by Lewis (2002) is a teacher-led instructional improvement cycle in which teachers work collaboratively to: formulate goals for student learning, plan a lesson, teach and/or observe the lesson, reflect on the gathered evidence, revise the lesson for improvement, and reteach the revised lesson. Through the use of Lesson Study, teachers have a means for planning, observing, and conferring with others. The Lesson Study works on the premise that the classroom lesson is the context that should be used to improve teaching (Stigler & Hiebert, 1999). The implementation of successful continuing professional teacher development programmes (CPTD) has been a challenge in South Africa since the introduction of Curriculum 2005. Lesson Study, a CPTD model introduced in Japan, has shown success in bridging the gap between policy at the national level and teaching at the classroom level (Coe, Carl & Frick, 2010).

Burney (2004) views Lesson Study as a process by which practitioners engage as researchers and scholars in their own classrooms by developing and testing lessons and studying their impact on students. Lesson Study as a practice provides a high-fidelity context in which teachers can build their Pedagogical Content Knowledge (PCK). Concerning PCK, the model of Ball, Thames and Phelps (2008) includes; knowledge of content and students, knowledge of content and teaching, and knowledge of curriculum. The main component of Lesson Study is the research lesson. Watanabe (2002:36) explains that "an individual teacher or group of teachers plans a research lesson by studying the lesson's topic, ascertaining where the topic fits into the curriculum, evaluating the strengths and weaknesses of typical approaches, and trying new ways to address weaknesses in the traditional approaches. The most common type of Lesson Study groups is school-based, but they can also occur at the regional and even national levels (Stigler and Hiebert, 1999 & Watanabe, 2002).

Design/Procedure

This study adopted a qualitative research approach design. Transcripts were analysed and conclusions drawn from the data. A total of 88 participants were involved this study. For the practical demonstration of an Open Class session, 15 grade three learners from the English medium class and a Mathematics teacher from a primary school in the Motheo education district, in the Free State, South Africa partook in this study as well.

In terms of the grade 3 learners, they attend a double medium school (English and Afrikaans) in a historically disadvantage area. This school has 1238 learners and 37 teachers. The parents of the English medium class seem to more involved in the children learning than the parents of the grade 3 Afrikaans medium classes. Furthermore, the learners from the English medium class appear to fair better in continuous assessment related tasks. Fewer barriers to learning are also experienced by the English medium class learners.

The other 72 participants (Teachers, academics and administrators) were part of the audience during the Open Class session during the work shop held at Central University of Technology in South Africa. Lecturer observations and video recordings were used as data gathering tool during the workshop and the practical demonstration of the Open Class. Informed consent was obtained from the teachers and the principals of the schools involved in the Lesson Study workshop (de Vos, Strydom, Fouché & Delport, 2002). Confidentiality of the data and freedom to withdraw at any time without penalty were guaranteed to all participants before they gave consent to participation (de Vos *et al.*, 2002). An authorisation to conduct this research in the Motheo education district was obtained from Free State Department of Education, in the Motheo District. Furthermore, an authorisation to hold the Lesson Study workshop and Open Class session at the Central University of Technology was obtained by university authorities (Mouton, 2012).

Findings/Analysis

Our analysis of the data was carried out in two phases. In the first phase, the research team observed the video data in real-time in order to identify and log the major events depicted in these tapes (e.g. the practical demonstration of the Open Class session workshop, and the Lesson Study reflection session). Next, the researchers coded the transcripts with the purpose of identifying issues raised by workshop participants and what could be applied in the South African school context as a means of enhancing teachers' pedagogical knowledge, professional development competencies and improve learners' performance in Mathematics (Stigler and Hiebert, 1999; Burney, 2004 & Watanabe, 2002).

- **Teachers' pedagogical knowledge**

An academically rich environment begins with teachers who are knowledgeable in Mathematics, knowledgeable of students and knowledgeable of teaching strategies (National Research Council, 2001). Knowledge of subject matter with an understanding of meaningful teaching results in a highly effective teacher (Phillips 2003). A clear illustration of this tendency can be seen in the comments of the participants.

Teacher Participant 1: *I have a question. I would like to know and understand how lesson planning for an Open Class is done.'*
Workshop Facilitator: *'Lesson planning as a team is a basic unit for Professional Learning Community (PLC) because the team at school will eat and work together every week. To be a community is to have a team. In each school we plan for the first, second and third term in*

one team. Teachers plan two lessons from the textbook and at the end of the week for the whole school. Afterwards, the teams will talk about what they did.'
Teacher Participant 2: '*Prof, please share with us the most central issues when planning lessons and identifying learners' problems'*
Workshop Facilitator: *'If I understand the question, when we plan the lessons the most central issue is to anticipate the student questions and this is then clearly written in a lesson plan. We then observe what they use in anticipation what to observe and what might be the difference. What really happen when you take notes, it is okay, if students have answered 2, it is also okay if they have answered 3. But sometimes we set some hypothesis, what happened with this difference, maybe the teaching is not clear, sometimes there is problem with material that we will bring for this discussion and will come back for this planning.'*

From the above said it can be gathered that joint planning is crucial to the success of the Lesson Study approach. Teachers develop a common understanding of the subject content to be taught, the pedagogical knowledge needed for effective teaching and also what the issues are with regards to general pedagogical knowledge (planning, teaching strategies, classroom dynamics and assessment).

- **Professional development competencies**

Teacher professional development is driven by the need to both extend and renew teacher practice, skills and beliefs. Stimuli for such needs may be curriculum change, new classroom technology, advances in pedagogy, or all of these (Doig & Groves, 2011). International attention has turned to less familiar, but apparently more successful, professional development practices, such as the Japanese Lesson Study approach for school Mathematics. Below are some excerpts of the conversation of South African delegates had about the Lesson Study approach that was administered during the workshop session held at the Central University of Technology.

Teacher Participant 3: *'I have a question. I would like to ask about the lesson. If the teacher presents a lesson, how many teachers support parents and learners on the topic when they are at home for the kids to learn Mathematics, especially, if the parents don't know mathematics as well.'*
Workshop Facilitator: *'But in our project at the end of the sermons, we invite parents to come to observe what and how the school teacher teaches mathematics. The parents are very happy to join and enjoy very much…'*
Teacher Union Participant 1: *'Thanks Prof, just a request to you. Share with us the structure of a lesson plan because my understanding of your approach is that in your research lesson teachers identify these learners' problems.'*
Teacher Participant 4: *'When we regard these sessions or when you refer to it as a problem causing out of which you generated a program that identifies a learner, as experienced now you go back and prepare to address these problems, what is it that you do in your preparations? Must it be in the plan? Must is be written? Must we talk and go plan, is it a statement?'*
Workshop Facilitator: '*The most central issue is to anticipate the student answers and to clearly write them in a lesson plan."*

Workshop Facilitator: *'It is about creating a professional environment, we need to come to the table and find common ground you must build teachers.'*

Emanating from the above said, it appears that the planning phase of the Lesson Study approach, is geared at providing professional development and personal growth opportunities to teachers for collaborating and reaching consensus around issue of lesson planning, the structure of the lesson and the envisaged presentation to be made. This process is central to building a community of practice for the Lesson Study approach.

- **Improve learners' performance in Mathematics.**

Lesson Study assist learners in improving their learning motivation, skill-process, knowledge, enthusiasm about engaging in cooperation, and good communication and intergroup skills (Vui, 2007; Sukirman, 2007). An illustration of this tendency can be seen in the comments/questions of delegates during the reflections on the Open Class session, during the Lesson Study workshop.

Department of Education Subject Advisor: '*How can the community be involved? The question should be what should school management do to get parents involved? And what should we do?'*
Workshop Facilitator: '*The family primary really supports to do other activity at home like… uh, they promote learning through the internet. But in our project at the end of the sermons we invite parents to come to observe what and how the school teacher, teaches mathematics. The parents are very happy to join in the class interactions and enjoyed it very much. A number of our Lesson Study projects are in very small schools, less than 120. Parents brought their children to big cities, when we started the project in Thailand. The community, the village can help the students of that school.*
Teacher Participant 5:' *An effective teacher for me can motivate a student irrespective of his background, the student sometimes learns. I don't want to say learning disabilities and external factors do play a role in learning. The school can also play to curb learning barriers but any way so effect teaching.'*
Workshop Facilitator: *'Children were made to be attentive, they are listening. They understood the work, each got to the answer using different methods. When asked about the division sign, the children showed the multiplication sign, ask the child about the sign and explain.'*
Workshop Facilitator: *'From my point of view, at the beginning of the activity, every student can engage in that activity. Every student can share, even if you have a language problem. There can be no difficulty from them. It depends on what language the students can engage. How we linked that activity into its simplest form is by engaging with students.'*
Workshop Facilitator: *'When changing the 12 sweets to 10 sweets when the children answered with 2, 5, The teacher could have changed the number of students grouping from groups of 4 to 6 or 2.*
Teacher Participant 6: *In other words, lesson planning assist teachers improving their lesson engagement and communication with learners.*

The improvement in Mathematics is dependable on a variety of factors which include aspects such as constructive and cooperative learning activities, collaborative lesson planning, the identification of learning barriers and the parental involvement.

Recommendation/Conclusion

Lesson Study provides opportunities for teachers to increase their knowledge for teaching Mathematics. Quality teaching requires sustained, intellectually demanding professional work- Lesson Study is a means to realise this.

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Off-Campus Activities of the Senior DTTE Students

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Abstract

This study seeks to find information about the off-campus engagement of the DTTE students and its effect on their academic performance in Mindanao State University-Iligan Institute of Technology. There were 52 senior DTTE students of the College of Education taking up Bachelor of Secondary Education major in Technology and Livelihood Education, Bachelor of Science in Technology Teacher Education major in Industrial Technology, and Bachelor of Science in Technology Teacher Education major in Drafting Technology chosen as respondents of this study. The study was conducted during the 2nd semester of the SY 2015-2016.

This study used the descriptive-correlation research design. According to Hungler and Polit (1999), this involves the collection of data that will provide an account or description of individuals, groups or situations.

The findings revealed that majority of the respondents are 20 years old as the regular age for the fourth year college, majority are female, majority are Roman Catholic for the religion, majority are Bisaya in Ethnicity, majority of the parents' monthly income are ranging from P10, 001 to P20, 000, most of the respondents are regular students which are paying and non-working. Those that are working students are said to have a monthly income ranging from P1, 001 to P2, 000. For the Cumulative Grade Point Average, majority of the respondents got 2.00 with the description of "Good" in accordance to the grading system of the institution.

Out of 710 responses on off-campus activities of 52 respondents, majority of them are said to be engaged in recreational activities, particularly in indoor with 402 responses, spending 1-4 hours per week with 4 years and above year engagement. It was found out that among the recreational activities, internet browsing has the most responses.

Findings reveal that majority of the respondents disagree that their off-campus activities can affect their academic performance in school. Furthermore, it was found out that the off-campus activities as perceived by the respondents' do not influence their performance in school as indicated by their CGPA.

Keywords: *In-Campus Engagement, Off-Campus Activities Influence, Off-Campus Engagement, Student Activities, Student Motivation, Student Performance*

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Introduction/Problem

Learning need not – and does not stop at the end of the school day. Many people believe that students spend their entire life in school. In fact, aside from school matters, most of the students in the Department of Technology Teacher Education in MSU-IIT are being captivated in off campus activities such as leisure activities and part- time job. This means that they do not just focus on studies but also have other concerns. Students devote their time, energy, and dedication to studies as well as off campus activities. Personal relationships and family commitments also pose significant demands on their time. However, students still have to provide time for their homework and school matters since it is still their priority.

The fact that most of DTTE students have off-campus commitment is one of the major concerns of the said department in the College of Education simply because this involvement is correlated on how students perform well in academics. These involvements may possibly help learners since they are exposed to real world situation or maybe, hinder their performance in school since most of their hours per day are provided for outside commitments.

The importance of the study pinpoints information about the learner's involvements in off campus activities and how they perceive these matters as factors that can affect their performance in school. This research will increase the level of awareness of the teachers about the 'outside life' of every student of the said department. The results will be given value since this will help the DTTE teachers on choosing what teaching strategies are appropriate when dealing these set of students.

In educational institutions, success is measured by academic performance, or how well a student meets standards set out by local government and the institution itself. As of how the students meet the demands, students engage with different activities outside the campus. These activities are called Off-campus activities. Off-campus activities are those of the activities regularly utilized by the faculty or the students of an educational institution that are located off the campus (Love To Know, Corp., 2016). As used in the study, Off-campus activities are those of the activities that the students are engaged of without the institution knowing it and with them profiting from it, whether it is for needs financially or to fulfill themselves with pleasure. These Off-campus activities are in a form of Leisure Activities and Part-time Jobs.

With these Off-campus activities, student's academic performance is affected. Students nowadays are engaged with different off-campus activities that may cause for their academic performance to deplete. When talking about "academic performance", they often think of a person's CGPA (Williams, 2015). People often consider grades first when evaluating academic achievement that is why in this study, the researchers used the CGPA to describe the student's academic performance. But, CGPA will be correlated with their perception if off-campus activities can affect their academic performance. Perception allows us to take the sensory information in and make it into something meaningful. The study needs the perception of the respondents in order for the researchers to know their thoughts if off-campus activities can affect their academic performance. Their perception varies according to experience. Some may agree or disagree if off-campus activities can affect their academic performance depending upon their past experience.

This study seeks to investigate if the off-campus activities of the senior DTTE students can affect their academic performance inside the four walls of the institute. The study was conducted during the second semester of the school year 2015-2016 with the DTTE students as the respondents.

Design/Procedures

This study used the descriptive-correlation research design. According to Hungler and Polit (1999), this involves the collection of data that will provide an account or description of individuals, groups or situations. One of the instruments that were being used to obtain data in a descriptive study is the questionnaire. Researcher's made questionnaire was used to gather data on the descriptive variables. The questionnaire was submitted for criticism to the adviser. After criticisms, it was revised on the basis of suggestions and recommendations given. As soon as the improved questionnaire was approved, the researchers of this study had taken a permit from the Dean of the College of Education for them to conduct the survey. With the permission of the Dean, the researchers then scheduled the day of the distribution of the researcher-made questionnaire to the chosen Fourth Year graduating students from the Department of Technology Teacher Education. The instrument was administered on the mid-months of the academic year 2015-2016. It was distributed by the researchers personally and retrieved immediately after answering, for the purpose of confidentiality. There were 2 attempts on the distribution of the questionnaires due to some errors and respondents' distrusting responses.

Findings/Analysis

The following were the findings arranged according to the objectives of the study.

Off-Campus Activities of the Senior DTTE Students

This part presents the analysis and interpretation of data. The discussion start with the descriptive findings followed by inferential statistics results, which answered the research questions cited in this study.

1. ***Profile of the Respondents***

1.1 Age

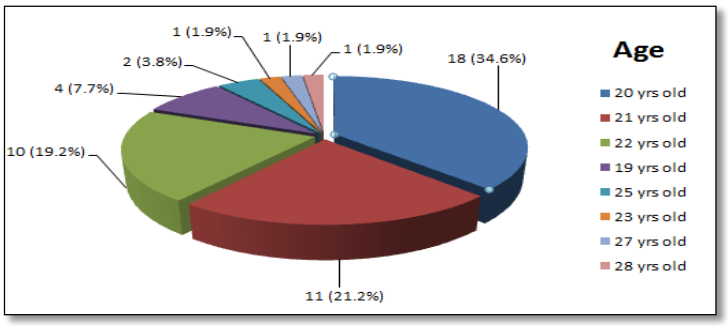

Figure 2. Frequency and Percentage Distribution of Respondents in Terms of Age

Figure 2 shows the frequency and the percentage distribution of respondents according to age. Among the 52 respondents, 18 or 34.6% are 20 years old which has the highest number of responses and 1 or 1.9% are 23, 27 and 28 years old which has the lowest number of responses. This result shows that majority of the respondents are 20 years old.

1.2 Gender

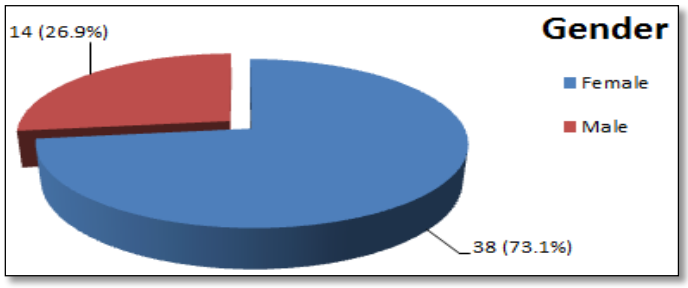

Figure 3. Frequency and Percentage Distribution of Respondents in Terms of Gender

Figure 3 shows the frequency and percentage distribution of respondents in terms of gender. Among the 52 respondents, 38 or 7.31% are female and 14 or 26.9% are male. This reveals that majority of the respondents are female.

1.3 Religion

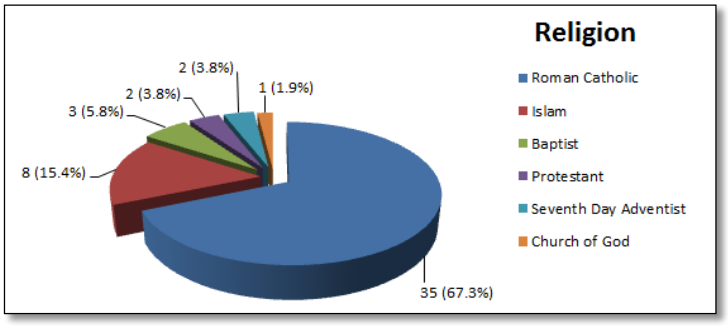

Figure 4. Frequency and Percentage Distribution of Respondents in Terms of Religion

Figure 4 shows the frequency and percentage distribution of Religion. Among the 52 respondents, 35 or 67.3% are Roman Catholic which has the highest number of responses and 1 or 1.9% are Church of God with the lowest number of responses. This shows that majority of the respondents are Roman Catholic.

1.4 Ethnicity

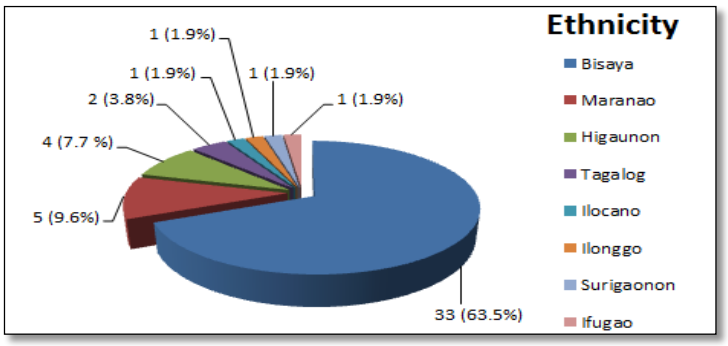

Figure 5. Frequency and Percentage Distribution of Respondents in Terms of Ethnicity

Figure 5 shows the frequency and percentage distribution of Ethnicity. Among the 52 respondents, 33 or 63.5% are Bisaya which has the highest number of responses and 1 or

1.9% is Ilocano, Ilonggo, Surigaonon and Ifugao which has the lowest number of responses. This reveals that majority of the respondents are Bisaya.

1.5 Parent's Monthly Income

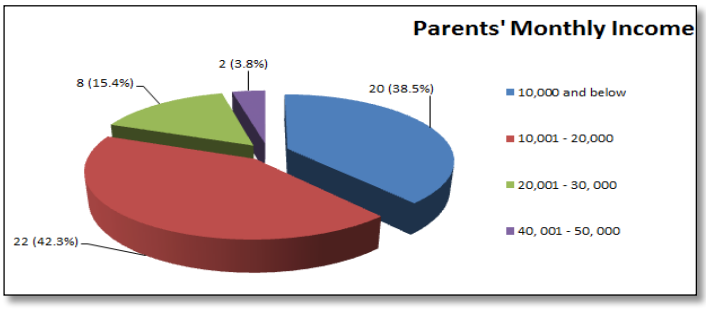

Figure 6. Frequency and Percentage Distribution of Respondents in Terms of Parents' Monthly Income

Figure 6 shows the frequency and percentage distribution of Parents' Monthly Income. Among the 52 respondents, 22 or 42.3% have a parent's monthly income of P10, 001 to P20, 000 which has the highest number of responses and 2 or 3.8% are in P40,001 P50,000 which has the lowest number of responses. This shows that majority of the respondents' Parents' Monthly Income are in P10, 001 to P20, 000.

1.6 Scholastic Status

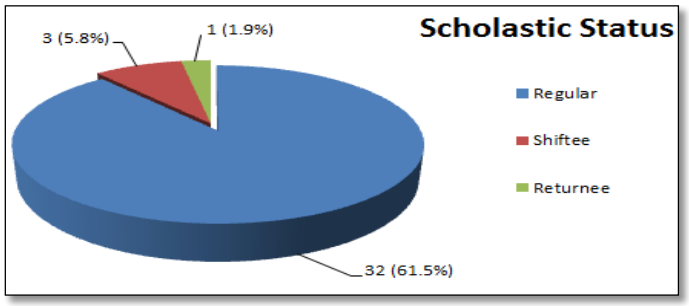

Figure 7. Frequency and Percentage Distribution of Respondents in Terms of Scholastic Status

Figure 7 shows the frequency and percentage distribution of Scholastic Status. Among the 52 respondents, 32 or 61.5% are Regular students which have the highest number of responses and 1 or 1.9% is Returnee which has the lowest number of responses. This means that most of the respondents are regular students.

1.7 Scholarship Status

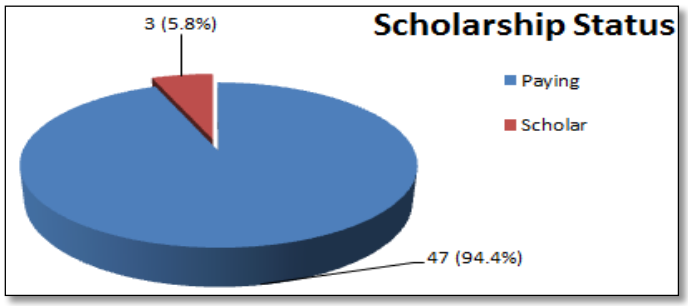

Figure 8. Frequency and Percentage Distribution of Respondents in Terms of Scholarship Status

Figure 8 shows the frequency and percentage distribution of Scholarship Status. Among the 52 respondents, 47 or 94.4% are paying and 3 or 5.8% are scholars. This shows that most of the respondents are paying.

1.8 Working or Non-Working Status

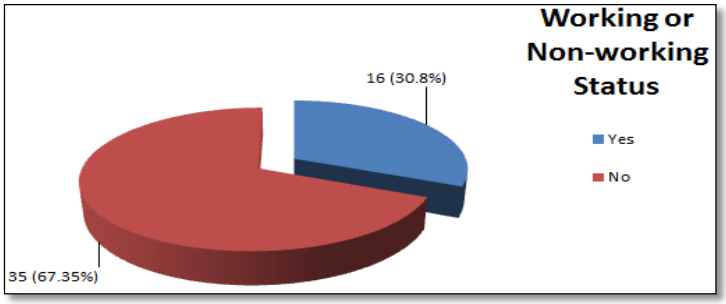

Figure 9. Frequency and Percentage Distribution of Respondents in Terms of Working or Non-Working Status

Figure 9 shows the frequency and percentage distribution of Working or Non-Working Status. Among the 52 respondents, 16 or 30.8% are said to be the working students and the remaining 35 are non-working students. The data presented above about scholastic status reveals that most of the respondents are regular students, this is because majority of them are non-working.

1.9 Working Students Monthly Income

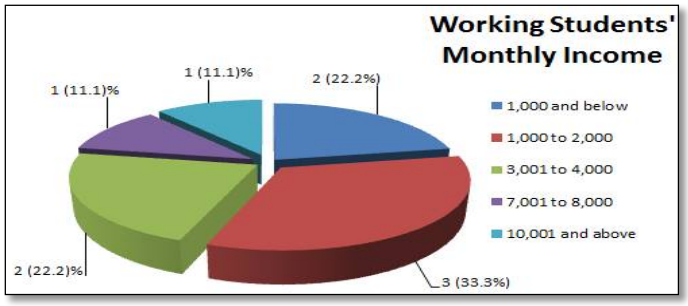

Figure 10. Frequency and Percentage Distribution of Respondents in Terms of Working and Non-Working Status

Figure 10 shows the frequency and percentage distribution of Students' Income. Among the 16 working students, 3 or 33.3% are having an income of P1, 001 to P2, 000 which has the highest number of responses and 1 or 11.1% have P7, 001 to P8,000 and P10,001 and above which has the lowest number of response. This reveals that some of the working students have an income of P1, 001 to P2, 000.

1.10 CGPA

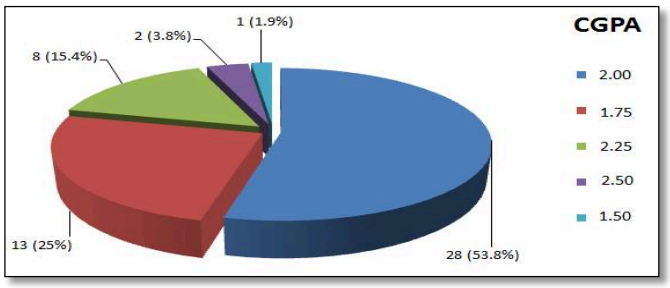

Figure 11. Frequency and Percentage Distribution of Respondents in Terms of CGPA

Figure 11 shows the frequency and percentage distribution of CGPA. Among the 52 respondents, 28 or 53.8% have a CGPA of 2.00 which has the highest number responses and 1 or 1.9% has 1.50 which has the lowest number of responses. This shows that majority of the respondents have a CGPA of 2.00 with a "good" remark.

2. *Off-campus activities of the respondents, their time and year engagement in such activities, and their perception if off-campus activities can affect their academic performance in school.*

Leisure Activity – Indoor Recreational Activities

Indoor Recreational Activities under Leisure Activities has 402 responses or 56. 62%. It reveals that majority of the respondents spent 1-4 hours per week in this activity with 103 responses or 26.41%, and involves themselves for 4 years and above with 312 responses or 84.10%. This implies that majority of the respondents spent 1-4 hours in indoor activities with 4 years and above year engagement. Internet browsing has the most responses with 45 or 11.22% (refer to Appendix E and F). These findings may be because the use of internet has been widely accepted as a way of improving students' performance in several subjects' area (Adegoke, 2016).

Majority of the respondents engage themselves on indoor activities than outdoor. This is because in developing societies, young people tend to spend most of their time at home with boys generally venturing outside the family with peers somewhat more than girls (World YOUTH Report, 2003).

Leisure Activity – Outdoor Recreational Activities

Outdoor Recreational Activities under Leisure Activities has 150 responses or 21.13%. It reveals that, majority of the respondents spent 1-2 hours in doing outdoor activities with 46 responses or 32.86%, and has 4 years above year engagement with 57 responses or 38.78%. This implies that majority of the respondents spent 1-2 hours per week in doing outdoor activities for 4 years and above. Hiking has the most number of responses with 24 or 16%.

Leisure Activity – Religious Activities

Under Leisure Activities are the Religious Activities with 135 responses or 19.01%. It reveals that, majority of the respondents spent 1-2 hours with 51 responses or 38.35%, and involves themselves in this activity for 4 years and above with 56 responses or 42.42%. Majority of the respondents strongly disagree that this activity can affect their academic performance in school with 56 responses or 41.48%. It implies that majority of the respondents engaged in this activity spent 1-2 hours per week and doing things that honors God for 4 years and above, and perceives this activity as a factor that cannot affect their performance academically. Reading religious materials has the most responses with 31 or 22.96%.

Part-time Job

Part-time job as an off-campus activity has only 23 responses or 3.24%. It also reveals that majority of the respondents engage in this activity spent 1-2 hours with 8 responses or 34.78%, and working less than 1 year with 15 responses or 65.22%. Majority of the respondents agree that part-time job can affect their academic performance in school with 8 responses or 34.78%. It implies that, majority of the respondents engaging in part-time job spent 1-2 hours per week working in less than 1 year. Being a tutor has the most responses with 9 or 39.13% (refer to Appendix E and F).

The proportion of respondents engaging in indoor activities under recreational activities is much higher than other off-campus activities with 402 responses or 56.62%. Internet browsing has the most responses with 45 or 11.22%. On the other hand, the proportion of students engaging in part-time jobs is much lower than the other off-campus activities with 23 responses or 3.24%. It implies that senior DTTE students are doing more indoor activities specifically internet browsing, than engaging on a part-time job. In time engagement, most of the respondents spent 1-2 hours per week in part-time job. Majority of the respondents engage in indoor activities for 1-4 hours per week. In year engagement, majority of the respondents have less than 1 year involvement in part-time job and 4 years above involvement in indoor activities.

3. Percentage Distribution of the Respondents' Off-campus Activities and their Perception if it can affect their Academic Performance in School.

Leisure Activity – Indoor Recreational Activities

Majority of the respondents disagree that Indoor Recreational Activities under Leisure Activities cannot affect their performance academically with149 responses or 38.50%. According to World YOUTH Report (2003, leisure time provides a rich opportunity for learning and a particular rich climate in which to facilitate the development of lifelong learners. Students may view leisure-indoor activities as a factor that cannot influence their academic performance in school because they can feel relaxation engaging in such activities.

Leisure Activity – Outdoor Recreational Activities

Out of the 150 responses of the respondents on Outdoor Recreational Activities under Leisure Activities, 52 or 40% of them disagree that it can affect their academic performance in school. According to World YOUTH Report (2003), leisure time provides a rich opportunity for learning and a particular rich climate in which to facilitate the development of lifelong learners. Students may view leisure-outdoor activities as a factor that cannot influence their academic performance in school because they consider it as an extension of the learning process.

Leisure Activity – Religious Activities

Majority of the respondents strongly disagree that Religious Activities under Leisure Activities can affect their performance academically with 56 responses or 41.48%. According to Kuh (2006), there is no evidence that spiritual practices have negative effects on other desirable activities, such as studying, deep learning, or extracurricular involvements. Kuh concluded that Spiritually-enhancing activities do not seem to hinder, and may even have mildly salutary effects on, engagement in educationally purposeful activities and desired outcomes of college.

Part-time Job

Majority of the respondents agree that part-time job can affect their academic performance in school with 8 responses or 34.78%. In other words, the greater the number of hours that students worked, the greater the negative effects on standardized measures of achievement. It is also found that the more hours that student worked; the more likely they were to get lower grades.

Findings reveal that the 52 respondents of the study have 710 responses on off-campus activities – 402 responses in Indoor Recreational Activities, 150 responses in Outdoor Recreational Activities, 135 in Religious Activities, and 23 responses in Part-time Job. Majority of them spent 1-2 hours per week with 208 total responses or 30.32%; been engage in such activities for 4 years and above with a total responses of 427 or 63.45%; and disagree that these off-campus activities can affect their academic performance in school with 260 or 38.52%. The respondents disagree that these off-campus activities can affect their academic performance in school.

4. *Relationship between the Profile of the Respondents, and their CGPA.*

Profile of the Respondents and their Perception Correlation

Personal Profile	r	P	Remarks
Age	.302	.037	Significant
Gender	-.099	.487	Not Significant
Religion	-.259	.067	Not Significant
Ethnicity	.184	.211	Not Significant
Parents' Monthly Income	-.113	.426	Not Significant
Scholastic Status	-.165	.338	Not Significant
Scholarship Status	.131	.364	Not Significant
Working or Non-working Status	-.155	.278	Not Significant
Working Students' Monthly Income	-.371	.326	Not Significant

Significant at 0.05 level

0.00-0.20 denotes negligible relationship
0.21-0.40 denotes low relationship
0.41-0.60 denotes marked relationship
0.61-0.80 denotes strong relationship

0.81-1.00 denotes very strong relationship

The table above presents the relationship between the profile of the respondents in terms of age, gender, religion, ethnicity, parent's monthly income, scholastic status, scholarship status, working or non-working status, and working students' monthly income, and their CGPA.

Age (r=.302, p=.307) registered positively low relationship. It has significant correlation with the CGPA. It implies that age influence the respondents' CGPA. Age of the individual, as it increased, usually affects various developmental stages (Okoh, 2010).

Gender (r=-.099, p=.487) registered negatively negligible relationship with the CGPA. It has no significant correlation. It implies that gender does not influence the respondents CGPA. Gender does not matter when it comes to the respondents' performance as indicated by their CGPA.

Religion (r=-.259, p=-.067) registered negatively negligible relationship with the CGPA. It has no significant correlation. It implies that religion does not influence the respondents CGPA. Students' religious belief has nothing to do with their CGPA.

Ethnicity (r = .184, p = .211) registered a positively negligible relationship with the respondents CGPA. It has no significant correlation. It implies that the respondents' sense of racial identity doesn't affect their academic engagement.

Parents' Monthly Income (r = -.113, p = .426) registered a negatively negligible relationship with the respondents CGPA. It has no significant correlation. It implies that the income of the respondents' parents cannot determine the extent to which they can learn.

Scholastic Status (r = -.165, p = .338) registered a negatively negligible relationship with the respondents CGPA. It has no significant correlation. This means that being a regular or irregular student cannot affect the students' CGPA.

Scholarship Status (r= .131, p = .364) registered a positively negligible relationship with the respondents CGPA. It has no significant correlation. It implies that scholarship status does not influence the students' performance in school.

Working or Non-Working Status (r = -.155, p = .278) registered a negatively negligible relationship with the respondents CGPA. It has no significant correlation. It implies that non-working students do not excel more than working students in terms of academic achievement.

Working Students' Monthly Income (r = -.371, p = .326) registered a negatively negligible relationship with the respondents CGPA. It has no significant correlation. This means that the working students' salary in a month, whether high or low, does not influence their performance academically.

5. *Relationship between the Respondents' Off-campus Activity Time Engagement, their Perception and CGPA*

Respondents' Off-campus Activity Time Engagement, Perception and CGPA Correlation

	Perception		CGPA	
	R	p	r	p
Time Engagement	.205	.146	.092	.516

Significant at 0.05 level

The table shows the relationship of the respondents' off-campus activity time engagement, their perception and CGPA.

Perception (r = .205, p = .146) registered positively low relationship with respondents' off-campus time engagement. It has no significant correlation. It implies that the amount of time the respondents spent for their off-campus activities does not influence their perception if it can affect their academic performance in school.

CGPA (r = .092, p = .516) registered positively negligible relationship. It has no significant correlation. It means that the respondents' time engagement on off-campus activities cannot affect their CGPA.

As a whole, the respondents' time engagement in off-campus activities does not influence their perception if it can affect their academic performance in school, and their CGPA because of the evidence that they only engage on such activities for a shorter amount of time per week.

6. *Relationship between the Respondents' Perception and their CGPA*

Respondents' Perception and CGPA Correlation

Intervening Variable	CGPA		Remark
	r	P	
Perception	-.027	.852	Not Significant

The table shows the relationship of the respondents' perception if off-campus activities can affect their academic performance and their CGPA.

Perception and CGPA (r = -.027, p = .852) registered negatively negligible relationship. It has no significant correlation. The table reveals that there is no significant relationship between the respondents' perception if off-campus activities can affect their academic performance as indicated by their CGPA. They disagree that off-campus activities can affect their academic performance; this perception does not influence their CGPA with majority having a 2.00 grade indicating only a "good" remark.

Based on these findings, the researchers infer that there are lots of factors that can affect the students' performance in school; off-campus activities are just one – it may or may not affect a students' performance in school.

Conclusions

Based on the forgoing findings of the study, the following conclusions are drawn:

1. The respondents engage themselves more on recreational indoor activities than doing part-time jobs.
2. The respondents perceive that involving themselves on an off-campus activity does not affect their performance academically.
3. Age is the only independent variable appeared to have a significant relationship with the respondents' CGPA. Aside from age, all other personal profile of the respondents' have no significant relationship with their performance as indicated by CGPA, thus the null hypothesis 1 is partially rejected.
4. There is no significant relationship between the respondents' off-campus activity time engagement, their perception if it can affect their academic performance, and their CGPA.
5. There is no significant relationship between the respondents' perception in off-campus activities and the respondents' CGPA, thus the null hypothesis 3 is sustained.

Recommendations

Based on the findings and the conclusion of this study, the following recommendations are drawn:

1. More students are being captivated with recreational indoor activities. With this matter, teachers must formulate learning activities and giving homework that suits to the activities that their students are doing outside the school like giving projects and assignments that can be done at home. Learning does not stop in school, thus it is good that the learning process inside the classroom also relates to the learning experiences of the students outside the campus.
2. Although there are less students engaging on a part-time job, the teachers should identify the working from non-working students in the classroom so that they can think of a better teaching strategy for them.
3. Since majority of the respondents engage much of their time in internet browsing, the teachers should come up with a better teaching strategy like giving online learning activities to the students inside the classroom.
4. Findings reveal that majority of the respondents engage on part-time job agree that their off-campus activities can affect their academic performance in school. It is recommended that further research should be done to investigate about the factors that can affect the working students' academic performance in school to support the findings of the study.
5. The respondents disagree that their off-campus activity involvement as a whole can affect their academic performance in school based on perception. However, it is still important that the teachers should undergone further research to make sure that these off-campus activities can really affect the students' academic performance in school.

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Integrated STEM Education through Project Based Learning in Programmable Logic Controller Course, Case Study: Electrical Technology's Students, Phranakhon Rajabhat University

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Abstract

This paper describes the use of STEM (Science, Technology, Engineering and Mathematics) Education to motivate Electrical Technology's Students, Phranakhon Rajabhat University in learning Programmable Logic Controller (PLC) subject. The research worked with two batches of students. Each batch was organized into four teams of five students. All students were first provided instruction in logic circuits and ladder logic. Ladder logic circuits for four tasks were created based on project-based learning (PBL); 1) simulation of automatic garage door, 2) simulation of four way traffic light, 3) controlling a light via a physical switch, and 4) physical control of traffic lights at an intersection. The students were asked to control the timing sequence of the lights. Upon completion of the eight hour lecture/laboratory period the student were surveyed. Student responses indicated that they strongly agreed that lecture materials using STEM education through project-based learning improved their understanding of PLCs, Boolean algebra and ladder logic. The activity was even considered to be fun by some students.

Keywords: *STEM Education, Programmable Logic Controller*

Introduction

Recently, there has been a shift from using lecture-based teaching methods in the undergraduate courses in engineering and technology disciplines to using a more student-centered teaching approach, such as STEM education, project and problem-based learning. This shift is due to the need for future technologists to demonstrate the use of higher-order thinking, problem solving, and interpersonal aspects, such as communication and team-work skills (NAE, 2005). This leads to the search for a new teaching method that will allow students to improve critical thinking skills. However, it is not an easy task to teach students to deal with the changing nature and the problems that will emerge. Therefore, both STEM education and project-based learning (PBL) have the potential to help students to cope with the demands of the complexities of the field. This research describes the use of STEM education and PBL to motivate Electrical Technology's Students, Phranakhon Rajabhat University in learning Programmable Logic Controller (PLC) subject that will allow them to develop critical and practical skills and to continually learn, problem-solve, and adapt throughout the course.

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Literature Review

1. STEM Education

STEM is the acronym for Science, Technology, Engineering, and Mathematics, and encompasses a vast array of subjects that fall into each of those terms. The term is typically used when addressing education policy and curriculum choices in schools and universities to improve competitiveness in science and technology development (Hernandez et al., 2013). Moreover, STEM education has become an international topic of discussion over the past decade. This is driven by the changing global economy and workforce needs that indicate there will be a shortage of STEM prepared workers and educators around the world. Improving teaching and learning in STEM education has become an economic factor in developing countries such as Thailand, and in long established economies such as Europe and the United States.

2. Project-based Learning (PBL)

Project-based learning is a non-traditional, student-centered approach that centers on the introduction of a real-life problem (Ehrlich, 1998). The students seek to solve this problem through investigation such as inquiry, creating and testing hypotheses, collecting data, obtaining and utilizing resources, and independent and collaborative research. Project-based learning in engineering and technology education often combines with STEM technique (Eberlein et al., 2008). The basic principle of PBL in science education is that students will learn and retain information more effectively when it is presented, discussed, and applied to a real-life format.

Bizjak (2008) described the incorporation of PBL in an electrical engineering graduate program in Slovenia. The students were divided into small groups to develop a plan for an electrical power network for a small village or town. The authors found that students gained more substantial knowledge than with traditional methods, as evidenced by higher test scores. PBL also received positive feedback from a survey questionnaire taken by students and faculty. Specifically, students reported that PBL allowed them to gain confidence in their problem-solving abilities, prepared them for their future careers, and improved their inter-personal and collaborative skills by working in a group.

3. Programmable Logic Controller

Programmable Logic Controllers (PLCs) were first introduced in the sixties to eliminate much of the hard wiring associated with conventional relay circuits. Today, the PLCs are used in numerous applications, such as, filling soft drink bottles, controlling vending machines, controlling traffic lights, etc. However, the concept of a PLC was new to electrical technology students. We first instructed the students in Boolean algebra, logic circuits, delays, and timers, and then introduced ladder logic for real time process control using a PLC. The ladder logic circuits were first tested on a simulation software before downloading to a PLC.

Methodology

Twenty electrical technology students in Phranakhon Rajabhat University enrolled in the Programmable Logic Controller course participated in this study. The research worked with two batches of students. Each batch was organized into four teams of five students. All students were first provided instruction in logic circuits and ladder logic. Ladder logic circuits for four tasks were created based on project-based learning (PBL). The first task was to develop a garage door control system, using four inputs and four outputs. The four inputs were: 1) a normally closed limit switch to sense if the door is closed, 2) a normally closed limit switch to sense if door is fully open, 3) a push button to open the garage door and 4) a push button to close the garage door The four outputs were: 1) a green light to show the

garage door is completely open, 2) a yellow light to show the garage door is fully closed, 3) a motor to open the garage door, and 4) a motor to close the garage door. The students were asked to work in teams of five. The garage door exercise created a lot of excitement. The students were able to test their circuits on the Mitsubishi FX Training PLC simulator. Figure 1 shows a screen shot of the garage door simulation.

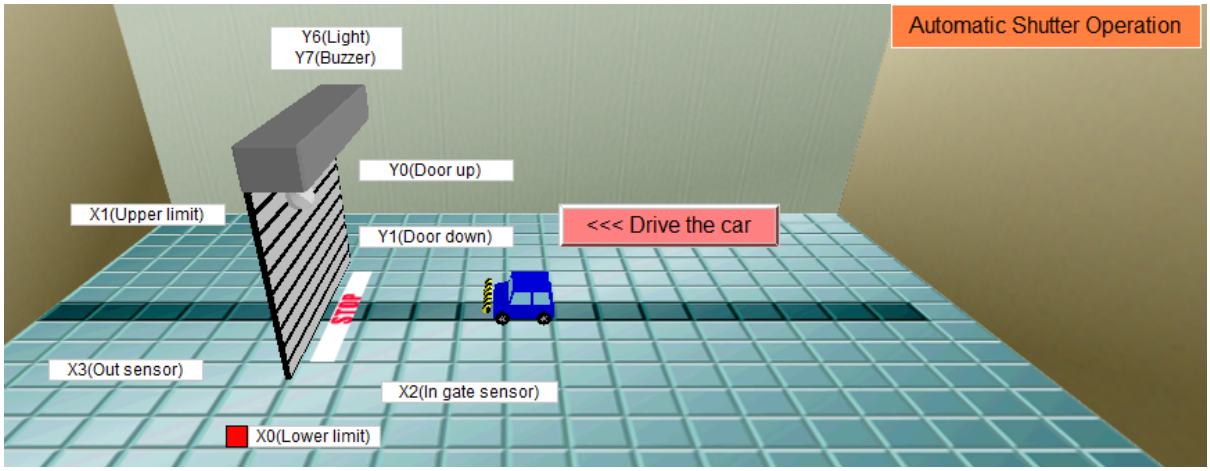

Figure 1 The PLC simulation of a garage door control system

The second task was traffic light simulation. The purpose of this exercise was to introduce timers and delays. The task given to students was to time the red, green, and yellow traffic lights. A screen shot of the traffic light simulation exercise is shown in Figure 2. The students were amused when errors in their logic caused cars to crash.

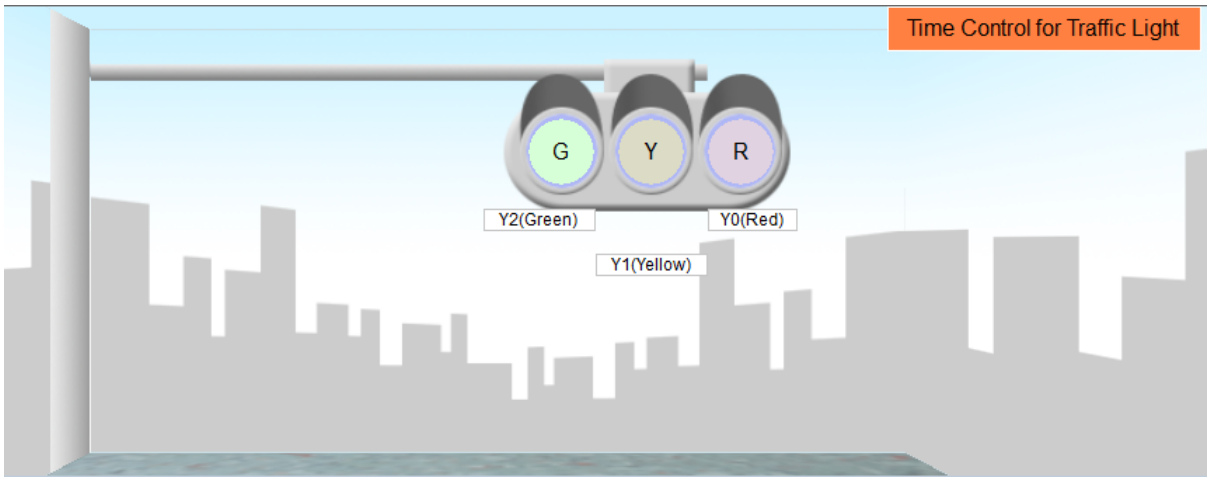

Figure 2 The PLC simulation of traffic light simulation

Control of a Physical System

The above simulation exercises laid a foundation for introducing control of a physical system. The students were eager to experiment with real hardware. The first exercise in this area involved a single input (a switch) and a single output (a light). A switch and the light were connected to a PLC. The first task on the physical setup was to down load ladder logic circuit to turn on light, when the push button is pressed. The next exercise was to control timing of light bulbs simulating a traffic light. The students were also provided eight switches (six on/off switches and two push button switches). One on/off switch was to be programmed as

a manual and auto switch. That is, in auto mode, the lights operated automatically according to the timing sequence shown in Table 1. In the manual mode, each light was controlled by a switch. If switch one is closed, the red light comes on, if switch two is closed, the yellow light comes on, etc. Each group of students were asked to give a presentation of their project and it was found that the hands on exercises generated a lot of excitement. It provided them an understanding of programming and real time process control.

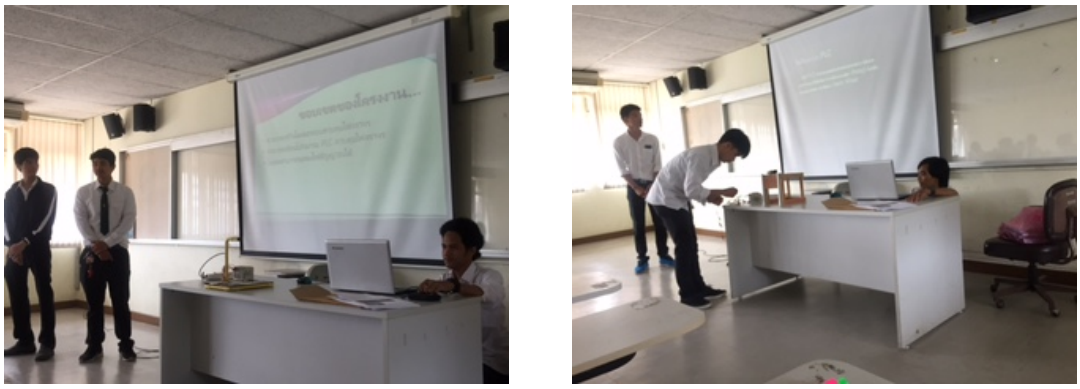

Figure 3: (a) physical control of traffic lights at an intersection and (b) controlling a light via a physical switch

Findings

Upon completion of the eight hour lecture and laboratory period, the students were surveyed. The various questions and student responses to the questions are summarized in Tables 1-5.

Table 1 : As a result of this week's activity, I gained an understanding of how Programmable Logic Controllers are utilized in industry

	Frequency	**Percent (%)**	**Valid (%)**
Strongly Agree	6	30.0	30.0
Agree	12	60.0	60.0
Neutral	1	5.0	5.0
Disagree	1	5.0	5.0
Total	**20**	**100.0**	**100.0**

Table 2 : As a result of this week's activity, I can read a ladder logic circuit.

	Frequency	**Percent (%)**	**Valid (%)**
Strongly Agree	14	70.0	70.0
Agree	6	30.0	30.0
Neutral	0	0.0	0.0
Disagree	0	0.0	0.0
Total	**20**	**100.0**	**100.0**

Table 3 : As a result of this week's activity, I can develop ladder logic circuit.

	Frequency	**Percent (%)**	**Valid (%)**
Strongly Agree	8	40.0	40.0
Agree	10	50.0	50.0
Neutral	2	10.0	10.0
Disagree	0	0.0	0.0

Total	**20**	**100.0**	**100.0**

Table 4 : As a result of this week's activity, I can use PLC simulation software.

	Frequency	**Percent (%)**	**Valid (%)**
Strongly Agree	10	50.0	50.0
Agree	7	35.0	35.0
Neutral	2	10.0	10.0
Disagree	1	5.0	5.0
Total	**20**	**100.0**	**100.0**

Table 5 : As a result of this week's activity, I can understand the relationship between Boolean Logic and Programmable Logic Controllers.

	Frequency	**Percent (%)**	**Valid (%)**
Strongly Agree	12	60.0	60.0
Agree	7	35.0	35.0
Neutral	1	5.0	5.0
Disagree	0	0.0	0.0
Total	**20**	**100.0**	**100.0**

The student responses indicated that a significant portion of them agreed or strongly agreed that lecture/laboratory material improved their understanding of PLCs, Boolean algebra, ladder logic, and hardware/software integration. In response to an open ended survey question, several students described the activity to be fun and interesting.

Conclusions

The objective of this research was to utilize programmable logic controllers with STEM and project-based learning to motivate twenty electrical technology students in Phranakhon Rajabhat University during learning the PLC subject. Four tasks were created based on project-based learning (PBL) and four teams of five students each were instructed in Boolean Logic and Mitsubishi FX Training PLC Simulator software. They were then provided the kits and asked to develop ladder logic circuits to control the traffic lights. The circuits were first tested on a simulator and then on the physical hardware. The student response to the hands on activity was overwhelmingly positive. Also, the results from this study suggest that students gained more during the project-based learning approach. Given that there is limited research on the beneficial effects of PBL on student learning and majority of this research on PBL has focused on student perceptions, the results from this study are important for electrical technology area as well as other STEM disciplines.

Acknowledgments

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A Study of Motivation and Attitude in Japanese Language Learning of Undergraduate Students at Thai-Nichi Institute of Technology

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Abstract

The purposes of this research were 1) to study motivation and attitude in Japanese language learning of undergraduate students at Thai-Nichi Institute of Technology 2) to compare students' motivation and attitude in Japanese language learning according to students' gender, academic year and faculty, and 3) to gather supplemental suggestions.

Research samples were 350 undergraduate students at Thai-Nichi Institute of Technology in second semester of 2016 academic year, derived through simple random sampling technique. The instruments used for gathering the data were the rating-scale and open-ended questionnaire. The statistics used for analyzing the data were frequency, percentage, mean, standard deviation, t-test, F-test, and content analysis.

The research findings were as follows:

1. Motivation and attitude in Japanese language learning of undergraduate students at Thai-Nichi Institute of Technology as a whole were at high level. When considered in each aspect, it was found that both motivation and attitude in Japanese language learning of the students was at high level.

2. The students with different genders showed that there were no significant differences in overall and each aspect.

3. The students with different academic years had no differences in the total. When considered in each aspect, it was found that there were statistically significant differences at .05 level on motivation.

4. The students with different faculty showed statistically significant differences in overall at .05 level. When considered in each aspect, it was found that there were statistically significant differences at .05 level on motivation and attitude.

5. TNI students had supplemental suggestions as following: speaking contents should have a variety of activities and communicative technique in Japanese speaking should be taught more in Japanese classes.

Keywords**:** *Motivation in Japanese Learning, Attitude in Japanese Learning*

Introduction

The significance of motivation has been a prominent area for research in psychology and education for many years. This may reflect the widespread perception of classroom teachers who tend to regard student motivation as the most important factor in educational success in general (Dörnyei, 2001). According to Ellis (2005), the aim of learning foreign language is to equip learners to communicate in the target language. Therefore, the learners

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will learn a language best if they have opportunities to use language in ways that resemble how it is used naturally outside the classroom. As stated by Oxford (1997, p.449), it is important to give the increased emphasis on the importance of participation in authentic communication in language teaching as well as the chance to do so.

In addition to Gardner (2006), motivation is a very complex phenomenon with many facets. However, the cognitivists view the term motivation as being more related to the learner's decisions as Keller (1983, p.389). Quoted by Brown (ibid, p.160), stated, "the choices people make as to what experiences or goals they will approach or avoid, and the degree of effort exert in that respect." However, in the constructivists' definition of motivation, they place "Further emphasis on social contexts as well as the individual's decisions". Although the importance of motivation in enhancing second/foreign language learning is undeniable, Lifrieri (2005) points out that "when asked about the factors which individual levels of success in any activity-such as language learning-, most people would certainly mention motivation among them". Brown (2000) indicates that "it is easy in second language learning to claim that a learner will be successful with the proper motivation", with similar views, Gardner (2006) posits that "students with higher levels of motivation will do better than students with lower levels". He further adds that "if one is motivated, he/she has reason (motives) for engaging in the relevant activities, expends effort, persists in the activities, attends to the tasks, shows desire to achieve the goal, enjoys the activities, etc" (Gardner, 2006, p.243).

Another approach is advocated by Starks & Paltridge (1996) who assert that learning a language is closely related to the attitudes towards the languages. Karahan (2007, p.84), further, highlights that "positive language attitudes let learner have positive orientation towards learning". As such, attitudes may play a very crucial role in language learning as they would appear to influence students' success or failure in their learning. This is supported by Gardner (1985) who considers attitudes as components of motivation in language learning. However, Wenden (1991) proposes a broader definition of the concept "attitudes". He states that the term attitudes includes three components namely, cognitive, affective and behavioral. A *cognitive* component is made up of the beliefs and ideas or opinions about the object of the attitude. The *affective* one refers to the feeling and emotions that one has towards an object, 'likes' or 'dislikes', 'with' or 'against'. Finally, the *behavioral* component refers to one's consisting actions or behavioral intentions towards the object.

Some studies have been carried out to investigate second/foreign language learners' motivation. These studies help the researchers to understand how to identify learners' motivation. According to Kato et al. (2007) who study the case of teaching Japanese language in Australia, it was postulated that the varying Japanese presence within the diverse environments would significantly affect student motivation. This relevant to Gardner (2001, p. 6) who states in Japanese that "*Suki koso mono no joozu nare*" (what you like you will do well in). This Japanese saying clearly points out that motivation is the "driving force in any situation". Motivation is, then, a prominent element in pursuing anything in our lives as the truly motivated individual display effort, desire, and affect.

Consequently, investigation of motivation and attitude in Japanese Language Learning of TNI students will be useful to generate more effective learning activities, teaching materials and teaching-learning process

Research Purposes:

1) To study motivation and attitude in Japanese language learning of undergraduate students at Thai-Nichi Institute of Technology.

2) To compare students' motivation and attitude in Japanese language learning according to students' gender, academic year and faculty.

3) To gather supplemental suggestions.

Methodology

Population and Samples

This research was to study motivation and attitude in Japanese language learning of undergraduate students at Thai-Nichi Institute of Technology in two aspects: motivation and attitude which consisted of population and samples as follows:

Research samples were 350 TNI students in second semester of 2016 academic year, derived through simple random sampling technique. The instruments used for gathering the data were the rating-scale and open-ended questionnaire. The statistics used for analyzing the data were frequency, percentage, mean, standard deviation, t-test, F-test, and content analysis.

Instrumentation

The instrument used in this study is a questionnaire. The questionnaire was conducted by the researcher, based on the motivation and attitude in Japanese language learning of undergraduate students at Thai-Nichi Institute of Technology. This research questionnaire was used to identify motivation and attitude in Japanese language learning of undergraduate students.

The first part (Part 1) of this questionnaire is about for the demographic information on their genders, academic years and faculties. Part 2 asks for motivation and attitude in Japanese language learning of undergraduate students.

The five levels of motivation and attitude in Japanese language learning used in the questionnaire are "The highest level", "High level", "Moderate level", "Low level", and "the lowest level". Responses from the student questionnaires were subsequently coded. The data of the students' coded responses were statistically calculated and analyzed. The computation of Cronbach's Alpha as a measure of reliability was employed to indicate how reliable the research questionnaire results are. Reliability is defined as the proportion of the students' responses to each item in the questionnaire and the reliability coefficient or calculated alpha is a lower bound of the true reliability of the research instrument, or the questionnaire. The descriptive statistics is also used to determine the individual summary statistics for each of the 50 items in the questionnaire.

The third part (Part 3) is to gather for more additional suggestions of higher education students about the motivation and attitude in Japanese language learning which based on open-ended questions.

Data Collection

The motivation and attitude in Japanese language learning perceived by Thai-Nichi Institute of Technology students were accessed through the questionnaire in second semester of 2016 academic year.

The administration of the research questionnaire was conducted at TNI. Part 1 concerns the demographic variables about their genders, academic years, and faculties. The 50 items of Part 2 cover motivation and attitude in Japanese language learning. Therefore, the participants were asked to consider each item carefully and indicate how important each item was for their study. The analyses of the research data were conducted by means of descriptive statistics. The descriptive statistical analyses of the frequencies and percentages of the students' responses were employed to report their demographic variables and to indicate the rank order of the items in each area of motivation and attitude in Japanese language learning

listed in the questionnaire. The frequency distributions were analyzed to determine the proportions of the students' responses to the five levels of importance on the 50 items in 2 - major area: 25 items of motivation and 25 items of attitude in Japanese language learning.

Data Analysis from Questionnaire

Data analysis from questionnaire both single item and whole questionnaire which presented a form of rating scale. These rating scales were calculated to find out mean and standard deviation and then translated based on criteria developed by Best (1981) as follows:

1.00 <= $\bar{x}$ < 1.50 refers to students' motivation and attitude in Japanese language learning at the lowest level

1.51 <= $\bar{x}$ < 2.50 refers to students' motivation and attitude in Japanese language learning at low level

2.51 <= $\bar{x}$ < 3.50 refers to students' motivation and attitude in Japanese language learning at moderate level

3.51 <= $\bar{x}$ < 4.50 refers to students' motivation and attitude in Japanese language learning at high level

4.51 <= $\bar{x}$ < 5.00 refers to students' motivation and attitude in Japanese language learning at the highest level

The statistics used for analyzing the data

The collected data was analyzed by using computer program. The statistics used for analyzing the data were frequency, percentage, mean, standard deviation, t-test, F-test, and content analysis.

Results

Results of Data Analysis

Phase 1: The results of demographic variable of higher education students

The analysis of the data from the students' questionnaire reported by higher education students in the 2016 academic year is presented in the first section deals with the demographic variables from the students' responses to Part 1 of the questionnaire: genders, academic years and faculties as following table.

Table 1: Table of the results of demographic data of respondents

Demographic data of respondents	n = 350	Percentage
Gender		
Male	187	53.40%
Female	163	46.60%
Academic Year		
First Year	111	31.70%
Second Year	75	21.40%

Third Year	151	43.10%
Forth Year	13	3.70%
Faculty		
Business Administration	142	40.60%
Engineering	138	39.40%
Information Technology	70	20.00%
Total	**350**	**100.00%**

Table showed that percentages of higher education students in genders ranged from 53.40% for male and 46.60% for female; in academic years ranged from 31.70% for 1st year, 21.40% for 2nd year, 43.10% for 3rd year and 3.70% for 4th year; in faculties ranged from 40.60% for Business Administration, 39.40% for Engineering, 20.00% for Information Technology.

Phase 2: Motivation and attitude in Japanese language learning of undergraduate students at Thai-Nichi Institute of Technology

Table 2: Table of mean and standard deviation of motivation and attitude in Japanese language learning of undergraduate students at Thai-Nichi Institute of Technology in total

Components	$\bar{x}$	S.D.	Level
Motivation	4.01	0.93	high
Attitude	4.03	0.88	high
Total	**4.02**	**0.90**	**high**

The table above indicated that undergraduate students had a high level of motivation and attitude in Japanese language learning in total in overall ($\bar{x}$=4.02). When considered in each aspect, it was found that both motivation and attitude of the undergraduate student were at high level.

Phase 3 The results of the comparison of motivation and attitude in Japanese language learning of undergraduate students at Thai-Nichi Institute of Technology

Table 3: Table of mean and standard deviation of motivation and attitude in Japanese language learning of undergraduate students at Thai-Nichi Institute of Technology in the total and each aspect

Components	Male		Female		t	p
	$\bar{x}$	S.D.	$\bar{x}$	S.D.		
Motivation	3.91	0.52	4.11	0.50	-3.67	0.43
Attitude	3.92	0.59	4.14	0.56	-3.54	0.77
Total	3.915	0.555	4.125	0.53	-3.60	0.60

*** Statistical significance at 0.05 level**

The table showed that students with different genders had no differences in motivation and attitude in Japanese language learning in total and each aspect.

Table 4: Table of comparison of motivation and attitude in Japanese language learning of undergraduate students at Thai-Nichi Institute of Technology according to academic years

Components		DF	F	P
Motivation	Between Groups	3	3.612	.014*
	Within Groups	346		
	Total	349		
Attitude	Between Groups	3	1.436	.232
	Within Groups	346		
	Total	349		
Total	Between Groups	3	2.508	.059
	Within Groups	346		
	Total	349		

***Statistical significance at 0.05 level**

The table showed that students with different academic years had no differences in the total. When considered in each aspect, it was found that there were statistically significant differences at .05 level on motivation.

Table 5: Table of comparison of motivation and attitude in Japanese language learning of undergraduate students at Thai-Nichi Institute of Technology according to faculty

Components		SS	DF	MS	F	P
Motivation	Between groups	2.451	2	1.226	4.518	.012*
	Within groups	94.137	347	.271		
	Total	96.588	349			
Attitude	Between groups	7.421	2	3.710	11.390	.000*
	Within groups	113.036	347	.326		
	Total	120.457	349			
Total	Between groups	4.466	2	2.233	8.351	.000*
	Within groups	92.796	347	.267		
	Total	97.263	349			

*** Statistical significance at 0.05 level**

The table showed that students with different faculty had statistically significant differences in overall at .05 level. When considered in each aspect, it was found that there were statistically significant differences at .05 level on motivation and attitude.

Phase 4 The results of supplemental suggestions about motivation and attitude in Japanese language learning of undergraduate students at Thai-Nichi Institute of Technology

Suggestions	N	Fre	%
	90		100
1. Speaking contents should have a variety of activities.		*26*	*28.88*
2. Communicative technique in Japanese speaking should be taught more in Japanese classes.		*22*	*24.44*
3. Students should speak with native speakers every day.		*15*	*16.66*
4. Kanji writing should be taught more in Japanese classroom.		*10*	*11.11*
5. Multimedia technology should be applied in Japanese classroom.		*8*	*8.88*
6. Japanese culture should be employed in Japanese classes.		*6*	*6.66*
7. The teacher should have various activities in Japanese classroom.		*3*	*3.33*

The table showed that TNI students had suggestions about motivation and attitude in Japanese language learning as following:

Suggestions from 90 students were: speaking contents should have a variety of activities. (28.88%); communicative technique in Japanese speaking should be taught more in Japanese classes. (24.44%); students should speak with native speakers every day. (16.66%); Kanji writing should be taught more in Japanese classroom. (11.11%); multimedia technology should be applied in Japanese classroom. (8.88%); Japanese culture should be employed in Japanese classes. (6.66%); and the teacher should have various activities in Japanese classroom (3.33%) respectively.

Conclusions

According to the study and data analysis, the results of this study were concluded as follows:

1. The percentage of students in genders ranged from from 53.4% for male and 46.6% for female; in academic years ranged from 31.7% for 1st year, 21.4% for 2nd year, 43.1% for 3rd year and 3.7% for 4th year; in faculties ranged from 40.6% for Business Administration, 39.4% for Engineering, 20.0% for Information Technology.
2. The undergraduate students had a high level of motivation and attitude in Japanese language learning in total in overall ($\bar{x}$=4.02). When considered in each aspect, it was found that both motivation and attitude of the undergraduate student were at high level.
3. The students with different genders had no differences in motivation and attitude in Japanese language learning in total and each aspect.
4. The students with different academic years had no differences in the total. When considered in each aspect, it was found that there were statistically significant differences at .05 level on motivation.
5. The students with different faculty had statistically significant differences in overall at .05 level. When considered in each aspect, it was found that there were statistically significant differences at .05 level on motivation and attitude.

6. Suggestions from 90 students were: speaking contents should have a variety of activities. (28.88%); communicative technique in Japanese speaking should be taught more in Japanese classes. (24.44%); students should speak with native speakers every day. (16.66%); Kanji writing should be taught more in Japanese classroom. (11.11%); multimedia technology should be applied in Japanese classroom. (8.88%); Japanese culture should be employed in Japanese classes. (6.66%); and the teacher should have various activities in Japanese classroom (3.33%) respectively.

Discussion

According to the study and data analysis, the results of this study can be discussed as follows:

1. A Study of Motivation and Attitude in Japanese Language Learning of TNI Students in Motivation was at high level ($\bar{x}$=4.01). This might be because the students had high desire to improve their Japanese to be more effective in order to visit Japan. This is similar to Gardner (2001, p.6) who describes that "what you like you will do well" or "Suki koso mono no joozu nare" in Japanese language. This Japanese saying clearly points out that motivation is the driving force in any situation. Motivation is, therefore, a prominent element in pursuing anything in our lives. The truly motivated individual displays effort, desire, and affect.

2. A Study of Motivation and Attitude in Japanese Language Learning of TNI Students in Attitude was at high level ($\bar{x}$=4.03). This might be because the students believe that a good command of Japanese will be linked to high achievement in career opportunity. This is related to Karahan (2007, p.84) who illustrates that positive language attitudes let learner have positive orientation towards learning. As such, attitudes may play a very crucial role in language learning as they would appear to influence students' success or failure in their learning.

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Implicit Beliefs as Determinants of Language Learning Amotivation of Filipino Students

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Abstract

Most studies are investigating about the construct of amotivation on how it is associated with other learning-related factors. However, there is a scarcity of research pertaining to learning English language amotivation, particularly with its antecedents. Studies linking implicit beliefs to language learning amotivation are yet to be done. To address the aforementioned gap, the main purpose is to examine the components of implicit beliefs among Filipino students as determinants of English language learning amotivation. A sample of 491 elementary pupils from different schools in Iligan City participated in the study. The results showed that the higher the learners' entity beliefs are, the higher they will be amotivated to learn the English language. Inversely, the findings showed that the higher the incremental beliefs the learners have, the lower they become amotivated. These imply that while the entity beliefs of implicit beliefs are predictors of language learning Amotivation, incremental beliefs greatly influenced the lowering of amotivation. This study proved that implicit beliefs differentially relate with value of task, ability beliefs, task characteristics and effort beliefs.

Keywords: *ability beliefs, effort beliefs, entity beliefs, implicit beliefs, incremental beliefs, language learning amotivation, task characteristics, value of task*

Introduction

One of the most leading academic problems of today's generation is the absence of motivation to acquire knowledge and to show interest in learning another language. It demands a lot of discussion in investigating the importance of amotivation in the language learning process. To further understand the construct of language learning amotivation is to determine on how it is associated with other learning-related factors. Unfortunately, there is a dearth of research pertaining to learning English language amotivation, particularly with its antecedents. To the author's knowledge, studies linking implicit beliefs to language learning amotivation are yet to be done. This is unfortunate as implicit beliefs have been shown to substantially affect learning process (Schommer, 2008; Chan & Elliot, 2004; Dweck, 2005). Further, most studies pertaining to amotivation is yet to be studied among Asian students, particularly among Filipinos. It would be of academic interest to examine English language learning process considering that although it is a foreign language, it is one of the two official language of Filipinos.

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LITERATURE REVIEW

Amotivation

According to Self-Determination Theory (Deci & Ryan, 1985, 2002), there are three categories of behavior regulation: intrinsic motivation (pleasure motives); extrinsic motivation (instrumental motives); and amotivation (an absence of motivation). The intrinsic and extrinsic motives represent another form of regulation. But the central focus, amotivation, is defined as a form of dysregulation which is characterized by a disconnection between an individual's behavior and outcome. There is a dearth of research on the discussions about amotivation. Studies show that amotivation is merely addressed as unidimensional in the field of sports, education and psychology (Green-Demers et.al, 2008). Vallerand (2001) stated that amotivation refers to a lack of willingness or intentionality to do the work appropriately. It is a state in which learners do not perceive the contingency between their behavior and the outcomes of their behavior.

Also, amotivation is characterized as learned helplessness and will result to disintegration of their commitments, unwilling to put efforts and to give completely on their desired tasks (Green-Demers, 2008; Legault, 2006). Being amotivated is literally non-motivated which makes the learner least self-determined and they are unable to cite any motives for enacting their desired outcome (Deci & Ryan, 1985). Amotivation also refer to perceptions that learners do not want to exert effort and energy required to integrate participation and learning (Pelletier et.al, 1999; Legault et.al, 2006). Thus, Legault et.al (2006) categorizes for taxonomy of reasons for academic amotivation based on ability beliefs, effort beliefs, value placed on the task and characteristics of the task.

Determinants of Amotivation

There are studies of amotivation but the treatment is unidimensional. The concepts of the universality of determinants affecting language learning amotivation are limited. Indeed, a research has supported the important role of self-efficacy beliefs as one of the determinants of amotivation among behavior of learner (McAuley, 1993). When self-efficacy is perceived in a high level, more ambitious challenges will be achieved and greater goal commitments will be fulfilled (Bandura, 1991). But when a learner's self-efficacy is uncertain, failures will take chances. Thus, it has been proposed that students who are most detached from school are not confident and consistent in their academic ability (Patrick, Skinner & Connell, 1993). For this circumstance, the learners will have academic difficulties and will result to low perceived competence (Wigfield, 1988). The pre-existing beliefs affecting language learning amotivation has yet to be recognized. Limited studies were focused in distinguishing the determinants of language learning amotivation existed such as age, gender, grade (Green-Demers, 2008), culture, level of consciousness, cognitive impairment or emotional distress (Marin, Biedrzycki & Firinciogullari, 1991), social preferences, environment and also beliefs itself. The issue of investigating the determinants of language learning amotivation is obviously demanding for consideration. The dearth of responsiveness to this problem may root to the students' discouragement to learn the language.

Implicit Beliefs

Implicit beliefs of students' academic ability play an important role on their motivation and learning. Implicit beliefs occurred as an independent variable to affect the language learning amotivation. However, the literature pertaining about implicit beliefs as an idea of dealing with their abilities makes it clear that there exist of further consideration and investigation for further understanding.

According to (Dweck, 1986, 1999; Dweck & Leggett, 1988; Dweck & Molden, 2005), implicit theories of students are commonly linked to academic abilities to achieve goals, response to difficulties and approach in learning. Implicit theories influenced student's achievement by means of the self-regulation and motivation strategies. Through this, researchers consider Dweck's theory called Implicit Theory of Intelligence. For instance, Dweck's model was designed to distinguish the learner's goal orientation and their ability to learn the language. Dweck (1996), in his research, implicit beliefs can contribute as factors of language learning since it is generally linked to an individual's ability to learn a certain task.

In few studies, student's implicit beliefs are estimated as an essential antecedent to accomplishment goal adoption (Spray et.al, 2003), and different goals of achievement in relation to their cognitive, affective and behavioral outcomes (Conroy et.al, 2007). More importantly, there are certain factors about implicit beliefs that are being focused. First, individual's behaviors should not be a hindrance on their ability to learn and foresee achievements. Second, the learner will tend to be helpless in doing their work if they are not motivated. And lastly, implicit beliefs have to develop the learner's ability and intelligence in seeking challenge and making effort on the assigned tasks. Through this, implicit beliefs indicated as an ability to motivate the learner regarding problem solving, verbal and social intelligence (Fry, 1984; Sternberg, Conway, Ketron & Bernstein, 1981) and social-practical aspect (Lynott & Woolfolk, 1994; Murrone & Gynther, 1991).

In conclusion, implicit beliefs are about setting an individual's learning goals while performing the desired aims. Consequently, if an individual cannot achieve their ability to learn, it can result to maladaptive and helpless orientations. This belief has been influencing the individual's goal and behavior in accordance to what they are capable to do (Bempechat, London & Dweck, 1991; Cain &Dweck, 1995; Hong, Chiu, Dweck, Lin & Wan, 1999).

Amotivation, through this research, clearly defined as a state in which learners cannot foresee a correlation between their behavior and that behavior's result (Deci & Ryan, 1985, 2002). Most commonly, amotivation has been linked to that of learned helplessness (Abramson, Seligman, &Teasdale, 1978). In conclusion, learners who lacks motivation tend to have negative outcomes such as depression, self-admiration, negative psychological effect and physical symptom (Green-Demers, 2008). In the academic domain, amotivation is associated with poor concentration, lack of knowledge, incompetency, unvalued activity, low involvement of the task and being dropped out (Vallerand et.al, 1993).

With the above stated circumstances, this study intends to show implicit beliefs affect language learning amotivation through existing studies. This proves that implicit beliefs are proved to be the antecedents of language learning amotivation. Furthermore, the perception of the students towards language learning amotivation should be taken into account and will create more information and investigation to identify how it is influenced for future research uses.

METHODS

Respondents

The target population consisted of grades 5 and 6 public elementary pupils in different primary schools in Iligan City. A total of 491 elementary pupils from eight different primary public schools are selected, namely; Iligan City Central School, Iligan City SPED Center, Villaverde Elementary School, Tambo Central School, Luinab Elementary School, Sta. Filomena Central School, Iligan City North Central School and Doña Josefa Actub Lluch Memorial Elementary School. The participants of the study ranged from ages 11 to 15 years old, consisting of 56.8% (n=279) female and 43.2% (n=212) male respondents. Most of the respondents of this study are 12 years old with a frequency of 235 (47.9%) under the purposive sampling method which was applied to the selection of participants.

Measures

Academic Amotivation Theory (AAI). Developing the measurement of the multidimensional nature of the academic amotivation construct of the learners (Legault, Green-Demers & Pelletier, 2006), a 16-questions based questionnaire was used. It constitute a 7-point Likert Scale (1 – does not corresponds to 5 – corresponds exactly) and responds to different concepts such as "For me, language learning holds no interest" and "Studying language is not valuable to me".

Implicit Theory of Intelligence. (ITIS: Dweck, 1999) newest version was used to assess students' entity and incremental conceptions of intelligence. This is to identify the measurement to ensure the students' ideas about their own intelligence specifically in their incremental and entity beliefs. The twelve (12) items questionnaire used to measure the belief that their intelligence is controllable or may become intelligent through their efforts. It is a 6-point Likert scale constitutes 1 as the highest rate (strongly agree) and 6 as the lowest rate (strongly disagree) manipulating the twelve (12) questions asked.

Procedure

The data were collected using sets of questionnaires. This set of scales is comprised of Academic Amotivation Questionnaires (value of task, ability beliefs, task characteristics and effort beliefs), and Implicit Theory of Intelligence Scale (entity beliefs and incremental beliefs) which were all validated and psychometrically cross-examined. Participants were then presented by their informed consent and assent form from the researcher signed by the research advisers with the approval of the Department of Education Division Superintendent along with the different school principals.

Data Analysis

This study used the Multiple Regression in gathering and analyzing the data. This approach is widely used in measuring the strength of association between variables. Moreover, there are two approaches of multiple regression that are being introduced to determine the quality of predictors. These two approaches are commonly termed as stepwise regression and hierarchical regression (Lewis, 2007). However, researchers were more captivated in determining the best predictors in this study. Thus, there was a need to identify

these predictors that can support the theories introduced in the framework. Therefore, in this study, the researchers used the Hierarchical Multiple Regression approach.

Hierarchical Multiple Regression is a useful method to predict a criterion language learning amotivation with sets of predictors epistemological and implicit beliefs. This is an appropriate tool to analyze the effect of the independent variables after controlling other variables. In this way, the researchers were able to see a variation on the dependent variables which was being influenced by the independent variables (Pedhazur, 1997). Generally, hierarchical multiple regression involves in choosing the best predictor of the study. In this manner, determinants were being based on the theories and existing researches along with the results of the target variables.

RESULTS

Socio-Demographic Profile

Table 1. Age and gender of the respondents

	Frequency	Percent
AGE (mean=11.87; SD= .779)		
11	168	34.2
12	235	47.9
13	73	14.9
14	14	2.9
15	1	.2
GENDER		
Female	279	56.8
Male	212	43.2
N=491		

The table shows that out of 491 samples, there are 56.8% (279) female and 43.2% (212) male respondents. Most of the respondents of this study are 12 years old with a frequency of 235 (47.9%), subsequently the respondents who are 11 years old with a frequency of 168 (34.2%), next the respondents who are 13 years old with a frequency of 73 (14.9%), then the respondents who are 14 years old with a frequency of 14 (2.9%) and the respondent who is 15 years old with a frequency of 1 (.2%). With the mean age of 11.87 (SD=.779), the respondents are 5th and 6th graders.

Intercorrelation between implicit beliefs (entity beliefs, incremental beliefs) and language learning amotivation

Table 2. Correlation of variables

	1	2	3	4	5
1. Entity					
2. Incremental	.342**				
3. Value of task	.154**	.205**			
4. Ability beliefs	.147**	.117**	.627**		
5. Task characteristics	.200**	.217**	.572**	.580**	
6. Effort beliefs	.052	.189**	.522**	.507**	.659**

Note: **p<.01; *p<.05; n=491

Means, the standard deviations and correlations between the study variables are reported in Table 2. The correlations showed that all variables were highly correlated ($p < 0.01$) with each other. The data reveal a number of interesting results.

Entity Beliefs and Amotivation

The entity belief of the learners is significantly correlated to amotivation. The study showed that the higher the entity belief of an individual, the higher its amotivation to learn the English language specifically in the components of value of task, ability beliefs, and task characteristics. The results suggest that learners who possess stronger entity beliefs are more likely bound to academic self-handicapping, helplessness and disengagement (De Castella & Byrne, 2015). These results are relevant to previous literature that supports the current study that learners who have intense entity beliefs stay away or dropout from school. Furthermore, learners who have strong entity beliefs are associated with poorer outcomes such as procrastination (Howell & Buro, 2009); lack of addressing strategies under stress (Doron, Yannick, Boiche & Le Scanff, 2009); mastery-avoidance goals (Elliot & McGregor, 2001); performance-approach and performance-avoidance goal orientations (Elliot et al., 2006); and poor mastery and high performance goals (Blackwell, et al., 2007). Evidently, learners who have stronger entity beliefs may not give enough amount of effort and will unlikely endorse achievement goals, attain high academic performance, and improve competence since they believe that their abilities are stable and unchangeable.

Entity Beliefs and Value of Task

The entity belief of the learners is significantly correlated to their value of task. This showed that the higher entity belief of the learner, the higher they become amotivated because of their value of task. The results suggest that the learners who have stronger entity beliefs in their value of task will likely devalue schooling that leads to school dropout (Legault et al., 2006) and will unwillingly commit whatever outcome of their behavior (Ryan & Deci, 2000) especially when the task is not on their interest. These findings could be foreseen in previous literature that tells that when the task on hand is not essential element to the learners, amotivation may occur (Legault et al., 2006; Green-Demers, et al., 2008). This entails that the learners will unlikely value and will detach schooling process that may affect their academic commitment (Battin-Pearson et al., 2000; Murdock, 1999) and academic

achievement (Hanson & Ginsburg, 1988). In connection with the results, the learners who have stronger entity beliefs become amotivated because they view tasks as an opportunity to prove their ability rather than to improve their ability (Dweck et al., 1995).

Entity Beliefs and Ability Beliefs

The entity belief of the learners is significantly correlated to their ability beliefs. This showed that the higher entity belief of the learner, the higher they become amotivated because of their ability belief. The results suggest that the learners who have stronger entity beliefs in their ability beliefs are more likely to bear expectations applying different strategies to achieve the task given (Skinner, Wellborn, & Connell, will likely have academic struggles when they perceive competence lowly (Wigfield, 1988), when they have poor self-efficacy expectancies about school activities (Skinner, Wellborn, & Connell, 1990), and when they experience insufficient academic ability self-concept (Eccles et al., 1993). This study is supported with previous studies that the learners who hold limited ability beliefs will likely fall into poor academic performance and self-confidence (Legault et al., 2006), negative school outcomes (Green-Demers et al., 2008), and school detachment (Patrick, Skinner, & Connell, 1993). This explains that learners who view their ability beliefs as fixed and unchangeable (Green-Demers et al., 2008) are more likely bound to become amotivated as it affects their self-esteem to completely execute a task (Legault et al., 2006).

Entity Beliefs and Task Characteristics

The entity belief of the learners is significantly correlated to their task characteristics. This showed that the higher entity belief of the learner, the higher they become amotivated because of their task characteristics. The results suggest that the learners who have stronger entity beliefs in their task characteristics will unlikely engage to school works when it is uninteresting (Ainley, Hidi, & Berndoff, 2002) and will likely withdraw from the task given when it is boring and dull (Legault et al., 2006). Learners who possess intense entity beliefs will unwillingly commit and regard to the school activities when it is not interestingly perceived (Ainley, Hidi, & Berndoff, 2002) as they believe that their task characteristics are fixed and hardwired (Atwood, 2010). Since the learners' task characteristic is associated with adaptive academic behavior (Legault et al., 2006), learners will become amotivated when they possess stronger entity belief.

Incremental Beliefs and Amotivation

The incremental belief of an individual is significantly correlated to the components of amotivation. The results showed that the higher the incremental belief of individuals, the higher they become motivated to learn the English language. Intrinsically, an individual who has stronger incremental belief believes that ability is flexible and can be more improved through effort. The results suggest that the incremental students perceive effort reasonably more salient (Hong, Chiu, Dweck, Lin, & Wan, 1999) and will likely exert more effort to increase the skills they lack when faced with failure (Hong et al., 1999). In line with this, this proves that the current study is related to previous studies as incremental students are negatively associated with procrastination (Howell & Buro, 2009), self-handicapping (Ommundsen, 2011) and positively associated with mastery-approach and mastery-avoidance goal orientations (Elliott et al., 2006). This proves that learners who have stronger

incremental beliefs endorse optimistic predictions about how they handle failures and take it as a challenge to achieve task success, improve competence, and value positive outcomes persistently.

Incremental Beliefs and Value of Task

The incremental belief of the learners is significantly correlated to their value of task. This reveals that the higher the incremental belief of the learner, the higher they become motivated on their value of task. The results imply that an individual who have stronger incremental beliefs will more likely to pursue learning and value every task given that will allow them to enhance their skills even if they will encounter short-term mistakes and uncertainty (Blackwell, 2002). Interestingly, even if the students convey negative information in valuing the language that they are learning, they are even motivated and less perturbed by the shortcomings and learn new approaches to improve more. These findings could also be seen in a past research that indicates that students show greater engagement and persistence in facing their setbacks and give value on learning a task from their mistakes and failures (Mangels et al, 2006). This greatly shows that the students will more likely to push through remedial actions and become more motivated in developing their future performance by learning the language even if they foresee detachment and devalue the task that can affect their academic behaviors (Bigelow et al, 2001). In line with the results, the students who have stronger incremental beliefs become more motivated and gain higher performance (Zahn & Elliot, 2008) because they regulate the level of their efforts during the acquisition and learning process (Dupeyrat & Mariné, 2005) and they perceive the cause of their disengagement and failure in the inefficiency of their methods (Delavar, Ahadi & Barzegar, 2011) and will more likely to improve it.

Incremental Beliefs and Ability Beliefs

The incremental belief of the learners is significantly correlated to their ability beliefs. The results suggest that the higher the incremental belief of a student, the higher they become motivated on their ability beliefs. This connotes that a learner who have stronger incremental beliefs tends to focus more on increasing their competence (Leonardelli et al, 2003) towards their ability to learn the English language despite their mindset of not trusting their ability to sustain the needs of what they learn. This also entails that students who believe that they have poor ability beliefs can actually spend desirable time to study and attend class regularly to positively influence their academic achievement, most especially in learning the language. Some past researches tell that those students who have strong incremental beliefs believe that their ability in dealing with the given tasks improve from time to time and can strengthen their persistence in the learning process (Herman et al, 2003). This positively shows that incremental learners have less discrepancy in their learning ability (Arkin et al, 2003) and become more motivated in their mastery goals to see improvement and growth in performance (Leonardelli et al, 2003). With this kind of result, the learners who have strong incremental beliefs become more motivated to become better because of how forward-thinking they are to enrich their ability to improve academic achievement despite having poor performance, low self-esteem and undesirable behaviors (Pelletier et al, 2006).

Incremental Beliefs and Task Characteristic

The incremental belief of the learners is significantly correlated to the task characteristics. The results suggest that the higher the incremental belief of a student, the higher they become motivated on the task characteristics. The results show that individuals who have been influenced by their incremental beliefs are more likely appreciative, interested and attentive in every task and gives enthusiasm (Hidi & Harackiewicz, 2000) and enjoyment in the learning process especially in learning the English language. Aside from this, they heighten the quality of their experiences (Schiefele, 1994) and give more focus on their learning engagement despite the unappealing characteristics of learning the language such as being too boring (Pelletier et al, 2006), irrelevant, uninteresting and monotonous (Green-Demers et al, 2006). Some research deals with the effect of these task characteristics that if students have strong incremental beliefs, they will likely feel the interest and pleasure and will inherently favor the characteristics of the task that is being taught to them (Ainlye, Hidi & Bemdoff, 2002; Pelletier et al, 2006). This reveals that incremental beliefs directly predict enjoyment (Wang et al, 2015) and interest whenever they learn the language. With the confirmation of the result, it greatly shows that students are intrinsically motivated to learn the language if they have stronger incremental beliefs because students are more concerned with the mastery and positive behavioral orientation of the task given to them rather than the negative characteristics of it (Biddle et al, 2015).

Incremental Beliefs and Effort Beliefs

The incremental belief of the learners is significantly correlated to their effort beliefs. The results entails that the higher the incremental belief of a student, the higher they become motivated on their effort beliefs. The results indicate that individuals who have stronger incremental beliefs are less defensive of their mistakes and shortcomings and make all the efforts to improve their learning towards the language and adopt mastery in every task given. It also shows that they give persistence, greater class engagement and resilience in every mistake that they commit (Mangels et al, 2006; Hong et al., 1999) and distinguish the level of every efforts before, during and after the learning process (Dupeyrat & Mariné, 2005). These results are connected to a previous study which tells that individuals' effort is a primary factor of their success that after experiencing failure of their efforts, they simply decide to exert more effort to improve their performance (Mickovska, 2009). They also have the instinct to make efforts and adopt strategies like note-taking, summarization and question and answer to be successful in their learning goals (Dahl, Bals & Turi, 2005; Husman, Hilpert, Stump & Lynch, 2009; Pressley & Harris, 2006). Evidently, it shows that when students have stronger incremental beliefs, they are more motivated to learn the language because they give importance to their efforts in achieving success, exerts stronger influence in doing challenging tasks and take one's control to execute hard work and consistency that encourage positive impact in learning the language.

Controlling for the demographic profile, are implicit beliefs significant determinants of language learning amotivation?

Table 3. Hierarchical multiple regression analysis of Implicit Beliefs predicting Language Learning Amotivation

	Academic Amotivation			Value of task			Ability beliefs			Task characteristics			Effort beliefs		
	B	Beta	Sig.	B	Beta	Sig.	B	Beta	Sig.	B	Beta	Sig.	B	Beta	Sig.
Step 1															
Age	-.161	-.007	.880	-.367	-.052	.248	.011	.002	.972	.316	.043	.338	-.121	-.016	.718
Gender	3.444	.093	.040	.974	.088	.051	.569	.054	.235	.760	.066	.143	1.140	.098	.031
Step 2															
Age	-.173	-.007	.867	-.370	-.053	.233	.010	.002	.973	.314	.043	.327	-.127	-.017	.700
Gender	2.949	.080	.071	.838	.076	.087	.467	.044	.326	.590	.051	.242	1.055	.090	.043
Entity	.319	.099	.035	.088	.092	.051	.110	.119	.013	.140	.140	.003	-.019	-.019	.695
Incremental	.570	.184	.000	.158	.170	.000	.066	.074	.119	.160	.166	.000	.187	.191	.000

Note: B= unstandardized coefficients; Beta= standardized coefficients; N=491

Controlling for age and gender, Table 4 shows that Implicit Beliefs are significant determinants of Language Learning Amotivation. The association between Learning Language Amotivation factors and Implicit Beliefs factors has an accounted variance of .98% with Entity Beliefs, and 3.39% with Incremental Beliefs based from more specific accounted variance of 2.89% with Value of Task and Incremental Beliefs, 1.42% with Ability Beliefs and Entity Beliefs, 1.96% with Task Characteristics and Entity Beliefs, 2.76% with Task Characteristics and Incremental Beliefs, and 3.65% with Effort Beliefs and Incremental Beliefs.

The results reveal that implicit beliefs serve as the determinants of language learning amotivation which perceive lack of control and competence and generally conform to learned helplessness. Also, it is shown that the higher the incremental beliefs, the higher the learners get motivated. With this, there is a great manifestation that implicit beliefs significantly predicted the ability of the learner whether to persist or resist. This denotes that learners with incremental view of intelligence tend to adopt learning goals in the most stimulating situation which also took part primarily in mastery and acquisition of the language (Dweck, 2000). Moreover, during the language learning, incremental learners perceive failures as their motivation to improve their skills. Through effort and practice, factors that consist the language learning amotivation are being disregarded. However, a learner with fixed outlook towards their ability to learn the English language cannot change their desired performance. Align with the result, it is more perceived that when entity learners do poorly and fail in language learning, they tend to be academically challenged and no personal control (Dweck, 2000). Shown in the results, the higher the entity beliefs of the learners, most likely, the higher the amotivation occurs. The study explored how implicit beliefs influence language learning amotivation. Through recent studies, much of the learner's intelligence in learning a certain field can be affected by amotivation will most likely to have self-enhancing biases (Chiu et al, 2011), pessimism, depression (Phelps et al 2007), poor self-regulation and low academic performance (Gramzow et al, 2010). However, the result attached endorses implicit beliefs as more of an independent variable that appraises one's ability and can improve their ability in learning the English language by their own.

Findings

The correlations showed that all variables were highly correlated with each other. First, this showed that there occurred a significant intercorrelation among implicit beliefs and language learning amotivation. Moreover, the entity beliefs of implicit beliefs are predictors of Language Learning Amotivation while the incremental beliefs greatly influenced the motivation of the participants. Although the results show different implications, this study proved that implicit beliefs are positively related to value of task, ability beliefs, task characteristics and effort beliefs.

All the variables of the study mostly express positive correlation with each other. This greatly conveys that there occurs a correlation between them. It can be said that the implicit beliefs as an independent variable do affect the dependent variable as a determinant of amotivation. Another argument for this could be that, when learners are dysregulated and detached in their specific learning outcomes based on what they learn from the different aspects in their ability to acquire knowledge, determinants work together and affect each other greatly. Results show that implicit beliefs are perceived as positive determinants of amotivation towards language learning.

Relationship between variables may diverge if data are collected from different schools. Some of the results in this study are contradictory with literature which might be due to the reason that there exist many factors which affect a performance of a student such as personality, ethnicity and environment which are not taken into consideration in this study.

Recommendations

On the basis of the findings and conclusion, the following recommendations are cited:

1. With the results of the study, school teachers should formulate and implement activities and other learning-based program that will enhance a learner's knowledge basically in language learning. Thus, this is to efficiently address concerns or gaps between the students and their knowledge and abilities. Educators must target and provide conducive and inclusive learning environment for students to get higher academic performance and competence towards their learning.
2. Guidance from authoritative sectors and facilitating on-hand and stimulating instruction of developing one's knowledge and ability should be the main concerns so as the students can develop better acquisition and retention of the language. In this way, intention to be amotivated will decrease or avoided.
3. For future researchers and students who would like to pursue a similar study about amotivation, choose other independent variables such as Epistemological Beliefs, so as to widen research in relation to language learning that addresses other factors particularly to its components namely; source of knowledge, certainty of knowledge, structure of knowledge, speed of knowledge acquisition, innate ability personal, innate ability general and real-world applicability.

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Indigenous Knowledge as Component of Indigenous Peoples Education Curriculum Framework

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Abstract

Indigenous knowledge matters in today's academic discussions spurred by educators' heightened awareness on environmental destructions and effects of climate change. Studies on indigenous knowledge are done with varying perspectives. Literatures suggest that early communities survived through social transitions guided by their indigenous knowledge. Thus, its relevance at present cannot be ignored.

The Department of Education in the Philippines (DepEd) issued the Department Order 32, series of 2015 on "Adopting the Indigenous Peoples Curriculum Framework", a government legislation mandating schools to contextualize the K to 12 curriculum based on the needs of local cultural communities. A culturally-responsive curriculum is being advanced.
In this paper, the relevance of indigenous knowledge to the indigenous peoples education curriculum framework is presented through mapping the interrelatedness of concepts. This is based on a case study of the indigenous knowledge of the Subanen tribe in Mindanao, Philippines. The Subanen is among the ethno-linguistic tribes that managed to retain its basic cultural identity though many of them have adopted modern living. Yet they have not totally abandoned their indigenous knowledge, and traits.

Utilizing the qualitative research paradigm, primary data were taken from the focus group discussion conducted separately in three groups among a total of sixteen Subanen, ten of them were male and six female. Five males were identified as tribal leaders. Data were interpreted utilizing thematic analysis. The emerging themes were mapped with the components of the Indigenous Peoples Curriculum Framework.

Results reveal interconnectedness of concepts evolving from the indigenous knowledge and the components of the DepEd Indigenous Peoples Curriculum Framework in terms of worldview, ancestral domain, social institutions, spiritual beliefs and environmental concerns. In local communities where the Subanen people dwell, utilization of their indigenous knowledge is recommended to enhance learners' appreciation of their culture.

Keywords: *Indigenous knowledge, indigenous people, interconnections.*

I. Introduction

Indigenous knowledge matters in today's academic discussions spurred by educators' heightened awareness on cultural diversity, environmental destructions and effects of climate change. The educational system has paid attention to society's cultural resources as part of the foundations of curriculum and basis for curricular planning (Offorma, 2016) and indigenous

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knowledge is an essential component. Studies on indigenous knowledge are done with varying perspectives and scope of application.

Its importance in the school system is emphasized in the studies of Offorma (2016) on integrating culture components in curriculum planning, Shizha (2014) on indigenizing the school curriculum, and Letsekha, et.Al (2013) on developing context-relevant teaching tools using indigenous knowledge.

Anthropologists advanced the concept of indigenous knowledge to refer to the traditional or local knowledge especially that of the early communities that serve as basis for recognizing cultural differences and other forms of knowledge (Lanzano, 2013). Indigenous knowledge system involves complex mental processes of interpreting and sustaining behavioral practices that constitute accumulated repositories of cultural adaptations of communities to various environmental circumstances (Doughty, 2005). Literatures suggest that early communities survived through social transitions guided by their indigenous knowledge. Thus, its relevance at present cannot be ignored.

In the Philippines, a variety of cultural traditions can be observed as practiced by diverse ethnic groups. This presupposes a rich scope of indigenous knowledge system (IKS) that continues to harness the solid foundation of each ethnic community to survive in spite of the advances in modern culture and technology. The Department of Education (DepEd) in the Philippines fully recognizes the importance of indigenous cultures in its pronouncements (DepEd Order 32, s. 2015), specifically adopting the Indigenous Peoples Education Curriculum Framework. The legislation stipulates the partnership of schools and indigenous communities in pursuing sustainable engagements with meaningful participation of their members utilizing their indigenous knowledge and learning systems in the Basic Education Curriculum.

This study highlights the indigenous knowledge system of one of the ethnic groups in the Philippines known as the "Subanen." Literally, the Subanen means 'people of the river', a term derived from the word *'suba'*, commonly understood by Visayan-speaking people of Mindanao as *'river'*. They live in the provinces of Zamboanga del Sur, Zamboanga del Norte and Misamis Occidental. The purpose of this paper is to map the interrelatedness of the indigenous knowledge of the Subanen with the Indigenous Peoples Education Framework (DepEd Order 32, s.2015).

II. Theoretical Framework

Indigenous knowledge refers to the local knowledge unique to a given culture or society. It is utilized by ethnic communities "as basis for local-level decision making in agriculture, health care, food preparation, education, natural resource-management, and a host of other activities" (Warren, 1991). It is "the information base for a society, which facilitates communication and decision-making" (Flavier, et.Al, 1995). It shapes the indigenous peoples' views of the environment, livelihood and health, social behavior and other areas of their life. Indigenous peoples learn it since birth, becoming a heritage of their everyday life, and adapted to local conditions. Though it is practiced over generations but its concepts could be subject to ongoing local negotiation and revision (Sillitoe, 2006). Although indigenous knowledge differs from what is taught in schools but it proves to be useful for the indigenous communities to guide them in their way of life. The continuum of indigenous knowledge and that of academic knowledge has been drawn out in the works of Sillitoe (2006) and it emphasizes an area of

convergence of concepts particularly on the natural environment. Current researches highlight the relevance of indigenous knowledge system to formal education.

III. Review of Related Literature

The multiplicity of indigenous knowledge guiding the subsistence farmers' to strengthen resiliency and adaptability in the midst of climate change is stated in Espaldon (2008). Suminguit (2005) also emphasized ethnobotanical knowledge as the "cumulative body of traditional knowledge about the interaction of human societies and the plant kingdom, and specifically, how indigenous peoples perceive, manage and utilize the plants around them." Components of indigenous knowledge system are noted in Orlove, Roncoli, et. Al., (2009). It explains how the farmers in Southern Uganda utilized their traditional climate knowledge in anticipating inter-annual variability in the timing and amount of precipitation, an important procedure for them since they are relying on rain-fed agriculture for livelihood. The four major components include: longstanding familiarity with the seasonal patterns of precipitation and temperature, a set of local traditional climate indicators, observation of meteorological events, and information about the progress of the seasons elsewhere in the region.

Studies on indigenous knowledge system were done in line with the efforts for social development (Mazzocchi, 2006, Sillitoe, 2006, Lanzano, 2013). Specifically, these studies are related to biodiversity and climate change adaptation (Ajibade 2007, Orlove, Roncoli, et Al., 2009, Egeru 2012, Soropa, Gwatibaya, et Al., 2015). Their findings explain the important considerations development agencies have to take in incorporating the indigenous knowledge of local communities to the effective implementation of social-environmental intervention programs.

The relevance of indigenous knowledge system in education is the subject of inquiry of Barnhardt (2005), Disbray (2014), Donato-Kinomis (2016) and Letsekha, et.Al (2013). They emphasize the important connection of indigenous knowledge system to teaching, curriculum and science concepts. Incorporating indigenous knowledge of local communities in teaching can help the learners being attuned to their environment, facilitate adjustment and appreciation of their own cultural identity. Shizha (2014) believed that an "indigenized curriculum will enhance success, cognitive development and academic achievements for students." A concept of pedagogy assuming the role of teachers as culture broker in the classroom was advanced by Jegede and Aikenhead (1999), in order to promote a culturally sensitive curriculum and assessment.

A wide gap of literature on the connection of indigenous knowledge and the school can still be observed in the Philippines. This is significant considering that Philippine culture is diverse with various ethnic groups possessing their particular beliefs, world view and concepts. Studies particularly on the Subanen culture have been done but they focus more on folklore (Enriquez, 1990 & Esteban, 2003), language, music and costume respectively (Lobel, 2010, Berdon-Georsua, 2004, Villanueva & Jomuad, 2013). Subanen ethnobotanical knowledge was the scope of the study of Suminguit (2005). Traditional knowledge in relation to health practices was described by Elago, Dando, et Al.(2013), while ethnofarming and healing practices were the highlights in the study of Valdez and Hansel (2012). An attempt to relate the Subanen themes of indigenous knowledge to teaching concepts of climate change adaptation had been initiated with some relevant findings (Tabudlong & Panorel, 2016). Few researches have been aimed at stressing the interrelationship of indigenous knowledge system of the Subanen to the

formal educational system. The current study is a further exploration to contribute to the attainment of such purpose.

IV. Design/Procedure

The study employed a qualitative and descriptive research design based on a case study of the Subanen ethnic group in the municipality of Concepcion, Misamis Occidental, in Mindanao, Philippines. Purposive sampling was done in selecting the key informants with a total of sixteen (16). There were ten (10) males and six (6) females with varying ages from thirty (30) to eighty (80) years old. Five (5) of the males were leaders. They were divided into three (3) groups during the conduct of the focus group discussion. Prior consent was obtained through the assistance of the Partnership for Rural and Technical Services, Inc. (PARTS), the non-governmental organization that provides assistance to the Subanen.

Data were interpreted utilizing thematic analysis as a method for identifying and analyzing patterns (Clarke & Braun, 2013) in the views expressed by the informants. Through concept mapping, the emerging themes of the Subanen indigenous knowledge were linked with the components of the Indigenous Peoples Curriculum Framework. Concept mapping in qualitative research facilitates analysis of themes and presents interconnection of ideas (Daley, 2004).

V. Findings/Analysis

Applying the procedures of thematic analysis advanced by Clarke and Braun (2013) such as familiarization of data, coding, searching for themes, reviewing themes, defining and naming themes on the indigenous knowledge of the Subanen, it then can be subsumed into these themes:

a) Worldview

Worldview refers to the cognitive understanding of an individual or community about the surroundings and the world based on certain standpoint. The beliefs and conceptual understanding of the Subanen reflect their worldview or their own basic perception of life, nature and relationships with one another. Their worldview is inherited from the beliefs and traditions of their ancestors. Central to their worldview is the interrelationship of unseen spirits, nature and humans. These spirits dwell in the lands and therefore, when people would cultivate the land, the spirits' permission needs to be sought first by performing rituals. Otherwise, untoward incidents might happen such as sickness or poor harvest.

b) Farming Practices and Procedures

Members of the tribe are expected to possess mastery of their farming practices and procedures. The Subanen observe a cyclical farming season established in the practice of shifting cultivation. Site selection serves as the first step. A good site is one that is closer to a water source such as creek or river. Site closer to a forest is also preferred since the soil is fertile. Subanen farmers would clear a certain vegetated area on a chosen day of the week, doing it simply by cutting the shrubs then burning these when dried. The lot will then be ready for planting. Planted crops are allowed to grow and be productive within 3 to 6 months. Harvesting will then be done with the members of the community helping one another. After harvest, the

lot will be left for a period of 3 to 5 years to fallow. Good seeds are preserved for the next planting season. As the vegetation grows again naturally, the soil will restore its fertility. The farmers will have to clear another area for the next cultivation cycle. When done traditionally, it implies a well-prepared activity and ritual in every phase of the cycle. They clear areas selectively. Only the lot that is believed to be permitted by the spirits is to be cleared. This limits their clearing activity so that other vegetated areas can still be preserved. They also choose the dry season in April or May to start tilling the soil for planting. They protect plants by cleaning the weeds, driving away wild animals and using hay or compost as fertilizer.

c) Farming Rituals and Meanings

The Subanen way of life is replete with rituals and meanings. Rituals enrich their varied life experiences that provide them with the sense of psychological, social and spiritual sense of stability. The rituals that the Subanen perform correspond to life events and socio-economic necessities. In these rituals, they always invoke the favors of the nature spirits so that the things they do, the event they celebrate or the plan they want to undertake will bring good to the individuals concerned and the community as well. A notable ritual is done during site selection where the *balyan* or community prayer leader would ask the permission of the nature spirits done together with the offering of foods. At the start of land cultivation, another ritual is to be done to avoid hurting the spirits. Before planting the seeds, these are sprinkled with blood of chicken or pig to ensure good harvest. The *balyan* and farmer would pray for favorable conditions for their crops as well as ask forgiveness and offer the same for everyone in the community. For the crops to grow well, another ritual will also have to be performed. When crops are ready for harvest, there is the ritual for tasting the budding fruits. The selected fruits to be tasted are to be offered first to the spirits to ensure bounty.

Since rituals are family and community affairs, these give opportunity for everyone to learn their cultural resources. Regular participation of the members would facilitate retention and memory especially these rituals are transmitted orally among them.

d) Affinity to the Natural Environment

The Subanen are characteristically close and sensitive to nature. Their worldview emphasizes the interrelationship of spirits, nature and humans. They are keen observant of natural signs such as behavior of insects, animals, river flow, appearance of the sky and constellations and many others. They are also sensitive to the animal sounds in their surroundings such as crowing of roosters, hornbill's voice, birds' chirping and others. Even flights of dragonflies could tell of coming rains. Remarkable changes of these behaviors are interpreted as signal of possible disaster like earthquake, drought, typhoon and flood. These serve as basis for the *balyan* to warn the community of a possible disaster. These signs would prompt the community to be prepared. They have familiarity of the signs in the sky that can indicate rain or drought such as the appearance of the moon, stars, and constellations. By observing the seasons, stars and moon cycle, they can determine the sunny and rainy days thus they can schedule their planting accordingly to ensure productivity. They also have established a system of plant identification that guides them in utilization of plants and herbs for food and medicinal purposes.

e) Spirituality and Moral Values

The Subanen believe that there are spirits dwelling in nature, sharing the land and its resources. Thus, they perform various rituals to appease these spirits, not to bring them harm. From this understanding, their reverence for the species found in nature is based upon. These reflect their ancestors' beliefs. However, many of them have accepted Christianity so that their religious concepts are somehow influenced by Christian belief without necessarily abandoning their ancient traditions. They believe in a God who can bring punishment to those who violate human nature and environment. Immoralities are believed to cause natural disasters such as typhoon, earthquake and lightning. They value prayer. They would pray to God in order to avert the chance of having disasters in their place. An act of committing sins is believed to hurt the spirits or other beings in the surroundings. Such spirits can cause punishment such as disasters or death. The *baylan* as a spiritual leader would remind the community to always live upright, otherwise they would be punished through natural disasters.

The Subanen practice a system of collaborative farming to enhance productivity and support for one another. A group of farmers can agree that each one of them will help cultivate the lot for one household. Once this is done, they can move to cultivate the lot of another household. It becomes a cycle of working together in the cultivation and harvest of the crops. Every household contributes to the work and in return each of them can also share in the harvest. Most of the women are also engaged in communal gardening. A group of neighbors would maintain together a common plot where they could plant vegetables and other crops. These practices promote team work and cooperation. It can build a strong support system among the households. It will help them develop resilience in spite of the difficulties brought about by climate change such as drought or heavy rains. Their social cohesion can also be an avenue for them to continue sharing new farming knowledge and techniques to improve their economy and environment.

The Department of Education in the Philippines (DepEd Order 32, s. 2015) stipulates the framework of the Indigenous Peoples Education (IPED) Curriculum to be implemented in schools with the K-12 Program. The IPED curriculum framework seeks to indigenize the K-12 Program to meet the learning needs of the local communities. It is based on culturally-responsive curriculum designed anchored on the features of the indigenous communities, namely: ancestral domain, community's worldview, indigenous cultural institutions, community's expression of spirituality, indigenous languages. These constitute the domains of learning in the IPED. These concepts are interconnected with the themes of the Subanen indigenous knowledge through the use of concept mapping.

As shown in the concept map, there is interrelatedness between the Subanen indigenous knowledge and the Indigenous Peoples Education (IPED) curriculum framework. The explicit connections are seen in terms of community's worldview, indigenous cultural institutions and community's expression of spirituality. There are implicit connections in terms of ancestral domain and indigenous languages.

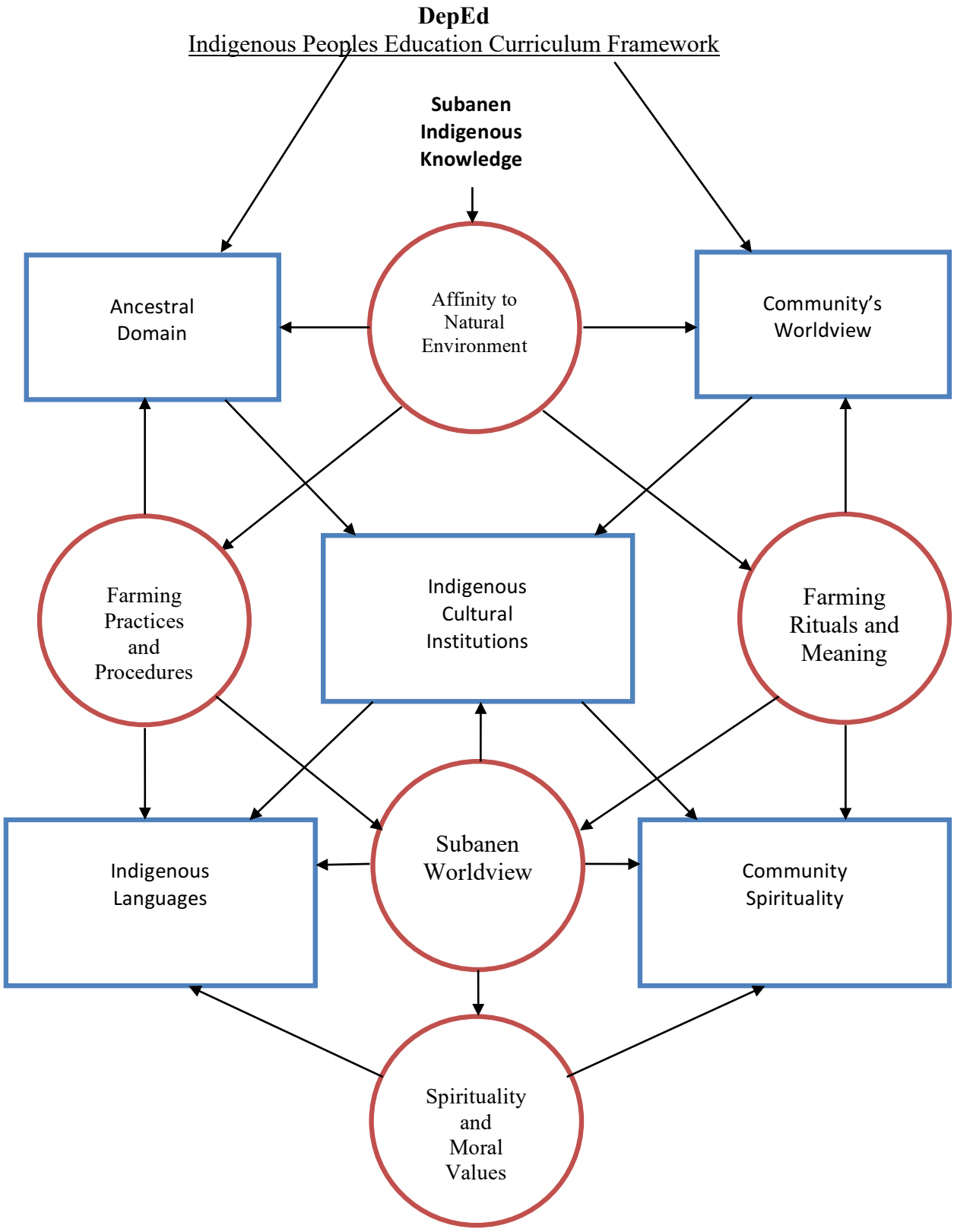
Community's worldview is emphasized in their concept of interrelationship of unseen spirits, nature and humans. Indigenous cultural institutions of the Subanen are observed in their adherence to the role of the baylan or religious leader and in the regular performance of rituals signifying various events in their life as well as farm activities. Collaborative farming practices strengthen their group cooperation and support. Their beliefs on spirits dwelling in nature form

the basic motivation for their sense of respect for the physical environment. Similarly, their view on immoralities as cause of natural disasters reflects the degree of spirituality anchored on a belief in a supernatural being.

Ancestral domain indicates the physical environment and natural resources that the indigenous peoples own as inherited from their ancestors or claimed on account of their being members of the ethnic group. Their concept of ancestral domain is recognized by Philippine law stipulated in a government approved legislation known as the Indigenous Peoples Rights Act (IPRA) stipulated in the Republic Act No. 8371(Official Gazette of the Republic of the Philippines, 1997). The same legislation also upholds the importance of indigenous knowledge system as foundation for learning and promotion of the well-being of the indigenous peoples. Understanding on ancestral domain comes with their worldview that the spirits dwell in the lands, waters, trees and other spaces. Thus, to appease them, rituals have to be performed before land cultivation, before and during planting, harvesting as well. They share the lands with their fellow tribe members. Their collaborative farming practice affirms the communal way of life and management of the lands or farms.

On indigenous language, the Subanen speak the widely-spoken Visayan language as their mother-tongue, although they also have their own native language. Communication is easily facilitated because they speak the language of the majority. In their everyday life, they use it in their conversation. It helps them easily communicate with other people in the community.

Interrelatedness of the Subanen Indigenous Knowledge and the Indigenous Peoples Education Curriculum Framework



VI. Conclusion and Recommendation

This study has found connection between the Subanen indigenous knowledge and the Indigenous Peoples Education (IPED) curriculum framework. The IPED seeks to indigenize the K-12 Program to meet the learning needs of the local communities. It aims to integrate into the curricular content and learning episodes the essential features of the indigenous communities as the essential components, namely: ancestral domain, community's worldview, indigenous cultural institutions, community's expression of spirituality and indigenous languages. The Subanen indigenous knowledge themes provide the context upon which the IPED curriculum framework components can be based. By utilizing the concept map, the Subanen indigenous knowledge themes can become relevant component to apply the Indigenous Peoples Education (IPED) curriculum framework in the basic education schools in the Philippines.

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Student Teachers' Perceptions of Mentor Teachers during School- Based - Learning.

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Abstract

School Based Learning plays a pivotal role in the initial development of student teachers, requiring their placement in schools in the first and second semesters to adhere to the prescripts of the minimum requirements for teacher education qualifications (MRTEQ). The placement of student teachers at the practising schools is a challenge that needs cooperation between the schools and the University. At the Central University of Technology, Free State, South Africa, the coordinators liaise with the principals of the schools who then appoint an experienced educator who plays the role of a mentor. The mentor teacher plays an important leadership role in guiding student teachers on their cumbersome route towards their professional development. One hundred and twenty (120) student teachers, 75 of which were females and 45 males doing 3rd-year B.Ed. (FET) level of training was randomly selected from a population of 318 students to partake in the study. They were from the diverse socio-cultural context of the South African society. A mixed-method approach was the main source used. A questionnaire containing 20 items on a five point Likert scale was used to obtain information from the respondents. The data collected from the questionnaire were analysed using SPSS statistical procedure. Four randomly selected students were interviewed. The average times for each interview were 30 minutes and were conducted after school hours. They were audio-recorded and fully transcribed by the researcher. Thereafter they were coded, narrated and transcribed thematically reflecting the respondents' perceptions of their mentor teachers. The results indicated that although mentors were helpful, students would sometimes feel that the mentors' behaviour and attitude towards them were not like that of leaders with leadership attributes. The article thus aims at proposing a framework that could establish a better relationship between the mentors and the student teachers during school based learning.

Keywords: *leadership attributes, mentor, mixed-method, perceptions, student teachers.*

Introduction/Problem

Introduction: School-based learning is a very important aspect of the training and development of student-teachers as it affords them an opportunity to put theory into practice and to explore the different educational context of teaching and learning. When student-teachers go out for school-based learning, the university or the college entrust them to the schools where they are being placed. The principal and his/her management team then appoint an experienced teacher to guide them in any way the school deems it fit with the understanding that they are there seeking an opportunity to practice the skills they acquired at the university or college. The experienced teacher becomes the mentor-teacher of the student-teachers. His/her role is to guide the student-teachers throughout the teaching practice session

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so that they could develop important professional knowledge about themselves, teachers, learners and the communities they come from and most importantly the teaching profession itself. The strong leadership role of the mentor-teacher in planning the daily activities of the student-teachers becomes apparent and vital to all those who are involved in teaching and learning. The problem is when student-teachers are sent to schools for school- based- learning as a requirement fulfilment of their professional obligation for a period of six to eight weeks, they are being expected to be given the opportunity to practice what they have been taught. The most unfortunate thing is that they seem not to be granted favourable reception. The aim of this paper is to explore the perceptions student teachers have towards mentor teachers during teaching practice in the Motheo District high schools focusing on the following questions: What are the perceptions of student teachers towards mentor teachers during school-based-learning? How is the working relationship between student teachers and mentor teachers in the Motheo District high schools? Do mentor teachers afford student teachers to showcase what they learnt during school based learning? The answers to these questions will provide possible deliberation on how to plan for future.

Literature review

There are various definitions of the term mentoring throughout all the disciplines associated with student teacher development (Eby, Rhodes, & Allen, 2011). Steg, Buunk & Rothengatter (2008:210) posit that mentoring is characterized by a one-to-one relationship between a senior member of the organization (the mentor) and the less experienced one (the mentee) and is often a newcomer in the organization. The trait theory of Allport that deals with the personality of the player as being judged by other persons and that the perceived is judged when the 'who' is perceived as the 'other' is pivotal in the paper. Allport distinguishes traits in various forms some being 'motivational' and others as being 'stylistic' and he goes on to say others are secondary. Thus defining a trait as 'a neuropsychic structure' having the capacity to render many stimuli functionally equivalent (Cook 1993:14). The definition that is adopted in this study is foregrounded on MRTEG and the once related to various components associated with teacher training models, collaboration, including experience, training, competency-building, modelling reflection, and mentoring as reflected in Garner et al. (2015) who together with her co-researchers give clarity on the various components as advanced by Ambrosetti, Knight, & Dekkers (2014).

Adediwura and Tayo (2007), move from the psychological concept or theory of Allport, when dealing with the perception of teachers' knowledge, in order to understand their academic performance. The honour is upon student teachers to act as the judges of the situation and staff members and mentor teachers they meet when reaching the schools. They are to use the common judgements they experience and state the special reason that comes to their assessment of things by placing them into categories.

Mwamwenda (2004) asserts that social learning theory can lead to modelling, eliciting, inhibiting and disinhibiting elements and further states that motivation and demotivation can make a person not to do something that he/she perceives as not motivating or rewarding. What it boils to is that student teachers in the teaching and learning environment may work with others to solve a problem just like he/she is being taught by the facilitator.

Drawing from these researchers makes it possible for student teachers to have a perception of school-based mentoring can also be found when they are involved in social-cultural perspectives, indicating that human activities are grounded in social participation with the help of others.

Design/Procedure

Quantitative and qualitative approaches were used in this paper. A qualitative method was predominantly used because the researcher was more interested in soliciting information from the student teachers with regard to their perceptions towards their mentor teachers. Leedy and Ormrod (2005) posits that convenience sampling "takes people as other units that are readily available" for selection. They further state that: "in this type of sampling some members of the population have little or no chance of being sampled". A qualitative approach with its inherent interpretive perspective of revealing experiences of the participants (Lapan et al 2012) and echoed by Lincoln (2010) that interpretivist wants to answer questions related to the narratives indicating lived experiences of the participants, is the cornerstone of the paper

Context of the study

Student teaching practice takes place in the first-semester for a period of four weeks followed by another six weeks during the second semester for the third-year Bachelor of Education further education and training (B.Ed. FET) programme. Many student teachers are placed in schools around the Motheo District (Bloemfontein; Botshabelo; and Thaba-Nchu). Due to the number of students doing the programme, many are encouraged to do school-based experiences in their home towns. During school based learning, student teachers are assigned to mentors, who are subject specialists of their two major subjects. To gain experience, student teachers are to work closely with their assigned mentor teachers. They are to observe their class teachers, prepare lesson plans, mark attendance registers, grab the opportunities of presenting their lessons and get the feedback on their class management skills.

Participants

One hundred and twenty (120) student teachers doing third year level of training were randomly selected from a population of 318 to participate in the study. The participants characterise of seventy-five (75) females and forty-five (45) males with the average age range of 22-24 years. They were from the diverse socio-cultural context of South African society, namely, Blacks, Whites, and Coloureds. The Black student teachers were in the majority and classified as being of the poorest section of the society.

Leedy and Ormrod (2005) posits that convenience sampling "takes people as other units that are readily available" for selection. Leedy and Ormorod (2005) further state that: "in this type of sampling some members of the population have little or no chance of being sampled". A qualitative approach with its inherent interpretive perspective of revealing experiences of the participants (Lapan et al 2012) and echoed by Lincoln (2010) that interpretivist wants to answer questions related to the narratives indicating lived experiences of the participants, as the cornerstone of the paper.

Data Collection

This study made use of the mixed method, that is, quantitative and qualitative approach to collect essential information. The researcher designed a questionnaire with the help of a statistician and an English lecturer. Section A of the questionnaire was about the biographical characteristics of the participants. Section B concerned the information the researcher wanted the participants to provide. Section C of the questionnaire had three open-ended questions about the relationship of the mentors and how they are being perceived by the student teachers. The questions rallied around: (a) the perceptions of student teachers towards mentor teachers during the school based learning, (b) their relationship with their mentor teachers and (c) the assistance they gained for having mentor teachers during a school-based learning period.
The Likert scale was used for rating the validity and reliability of the tool. To ensure validity, the researcher with the help of the lecturer of statistics was able to structure the questions for the collection of data from the respondents. Two lectures were also used to cross-validate the instrument to ascertain the correctness of the language followed by proof-reading that was done by the language practitioner. This helped in the establishment of content and face validity and the final tuning of the instrument.

Data Analysis

The quantitative data were entered into an MS Excel spreadsheet and collated. Audio digital recorder and notes taking were used for data collection. The collected qualitative data were transcribed and content analysis was carried out for the purpose of translation and analysis. The emerging themes and sub-themes were recorded to express the experiences and attitudes of the student teachers towards their mentor teachers.

The main interest of the researcher was to try to understand the experiences of the respondents within the context of teaching practice environment. The researcher searched for patterns of meanings from the statements and explanation made by the students. From there, themes were highlighted, constructed and categorised. These categories emerged progressively from the data as the analysis proceeded.

Biographic Data of Participants

Table 1: Demographic Profile of Participants

Age Range	female	male
18-20	5	3
20-22	16	11
22-24	32	15
24-26	22	16

Table 1 above presents in detail the biographic data of the participants in the study in order to

inform the reader of the characteristics of those who participated in the study. The table shows that 5(4.2%) females and 3(2.5%) males were in the age range of 18-20 years and 16(13.3%) females and 11(9.12%) were in the age range of 20-22 years. There were 2(26.7%) females in the age range of 22-24 years as compared to 15(12.5%) males followed by 22(18.3%) females and 16 13.3%) males in the age range of 24-26 years.

Table 2: The reception during the first day at the school.

Strongly agree	Agree	Not sure	Strongly Disagree	Disagree	Total
75	30	2	5	8	120
62.5	25	1.7	4.2	6.6	100%

Table 2 shows that 105(87.5%) participants mentioned that the reception they received from the members of the school was unfavourable as compared to the 13(10.8%) who did not affirm. Only 2(1.7%) participants were not sure.

Table 3: Benefits gained by having mentor teachers

Strongly agree	Agree	Not sure	Strongly Disagree	Disagree	Total
12	21	4	65	18	120
10	17.5	3.3	54.2	15	100%

Table 3 indicates that 83(69.2%) participants were positive that mentor teachers were really helpful as compared to 33(27%) respondents who indicated otherwise. It is evident that 4 (3.3%) participants were not sure of how to respond.

Interview Results

The qualitative data analysed in this section were obtained from the interviews held with a sample of four participants. The researcher conducted interviews with participants in order to solicit more information on how they perceived mentor teachers. They were requested to participate in the interview with the assurance that what they were to say would not be revealed to other people. Their names would not be revealed and that the interview was to take forty-five minutes per a respondent.

Figure 1: Help by the mentor teacher

Interview responses

Respondent 1: *"The first time we met the staff as a whole it was a hell. They did not care about us. We were like people who came to take their jobs." We were really scared until the principal introduced us to them and told us who our mentor teachers will be."*

Respondent 2: *"Teachers normally take time to speak to us and thanks to the intervention of the principal and the mentor teachers who advices us to stay clear from those who give us cold shoulders."*

Respondent 3: *"What I like about my mentor is that she gives me an opportunity to show what I learned from her without interfering and gives me chance to teach."*

Respondent 4: *"Listening to the advices of the teacher is far beneficial to our developing of skills and how we can manage our classrooms and get professionally developed. It really helps to have a mentor teacher guiding us."*

Respondent 1: *"I am motivated by the way my mentor respects my opinions and the encouragement that I will be a good educator."*

Data Analysis transcription was crucial as a process of converting recorded information into text and a precursor to starting with the analysis of the responses collected (King & Horrocks 2010). Analysis of the above responses suggests that the student could engage mentors in various activities such as, adopting the personal attributes of the mentors and the advice they acquire from them, with the aim of targeting the learners' zone of proximal development so that the can involve learners in class activities (Vygotsky 1986; Maimane 2006; Sempowicz & Hudson 2011; Mokhothu & Maimane 2017), that could be of benefit to their practicum. It also suggests that having a mentor could help them in gaining more knowledge with regards to the mastery of the content, class management and professional development. Student

teachers felt inspired and determined to do the given assignments such as marking of the learners' scripts and all school's activities. In a nutshell, a cordial relationship built between the student teachers and mentors create school-based-learning to be a relaxed undertaking.

Figure 2: An opportunity to showcase what I learnt

Findings/Analysis

The findings and analysis are that, at the beginning of school-based-learning, students were not comfortable with being members of the schools where they were placed until the principal intervened. When they got used to the place under the mentorship of their mentor teachers they started to perform to the best of their abilities with more opportunities given to them. They appreciated what they were being taught and the experiences they gained.

Recommendations

For school-based-learning to be successful all the stakeholders involved should strive for the same goal and commitment. Proper planning by the practising schools should be a prerogative for the professional development of student teachers. Mentoring should be the bedrock of improving the provisional knowledge and skills of the student teachers.

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An Emotional Intelligence (EI) Competency Framework for School Change in the South African Context

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ABSTRACT

Copious research studies confirm that the emotional well-being of the educator and the learner is increasingly recognised as an important predictor of schooling success. In addition, EI is outlined as foundational to getting along with others in the workplace, as well as being a primary managerial and leadership competency. The purpose of the study was to develop a competency framework to assist educators and learners to manage the process of change within schools. In developing such a framework, the objectives of the study included delineating EI as a key ingredient to executing change initiatives and as an important contributor to schooling success. To achieve the purpose of the study a quantitative theory of change methodology was applied. Structured questionnaires were distributed to educators and learners at four secondary schools in two provinces in South Africa to review their responses to the process of change at their respective schools. The results of the empirical investigation revealed that school leaders have to take into account the emotions of their educators and learners and provide mechanisms for them to cope with imposed school changes. An EI competency framework was proposed to assist educators and learners to deal with change in an emotionally intelligent way.

Keywords: *Emotional intelligence (EI); School change; Competency framework*

INTRODUCTION

Education is generally considered to play a critical role in the reconstruction of post-conflict countries, especially in transforming people's mind-sets and rebuilding social relations (Rubagiza, Umutoni & Kaleeba (2016). Educators in this space, are regarded as agents of transformative change and are expected to possess the skills to function in an ever-changing environment, including maintaining sound interpersonal relationships with leaders and learners.

Responding to change is an educational task, in which schools as institutions need to think through problems, analyse data, debate options and values, develop and test strategies (Levin & Riffel, 2004:367). Traditional leadership and management approaches are well able to accommodate technical problems. The future, however, is about solving problems for which there is no immediate solution, and then to build the capacity for doing this into the medium and long term (Davies, 2007:168)

Donald, Lazarus and Lolwana (2002) contend that at the centre of transforming the process in education is the need to change the values, understanding and actions of individual people specifically educators and learners. Traditionally, South African schools were hierarchically structured organizations in which key decisions were taken by people at the top and communicated down to ordinary educators. Successful change initiatives in the educational setting depend on the skills, behaviour and understanding of its managers and

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leaders. Moreover, the imperative therefore rests squarely on the shoulders of principals to initiate change taking into account the emotional realities of the school environment and respond accordingly. To create a secure environment the leader must take account of the relationships between people (Burton & Bundrett, 2005:51), how interaction is developed within the school community and how individuals are enriched. This is particularly relevant in the South African school context as schools are generally under-resourced with staff compositions that are under-qualified to support change efforts.

THEORETICAL FRAMEWORK

The EI Competency framework proposed in this paper signifies a collaborative *theory of change.* Using this approach, a *theory of change* is co-created through collaboration between school leaders, educators and learners. The researcher takes the position of a critical friend with a support and challenge role with stakeholders. A *theory of change* articulates explicitly how a project or initiative is intended to achieve outcomes through actions, while taking into account its context. Developing a *theory of change* for an initiative changes the way of thinking from what you are doing to what you want to achieve (Laing and Todd, 2015). The way in which initiatives are implemented is crucial, and context is not just another variable but a critical part of the success or otherwise of achieving change.

Adopting an emotionally appropriate response to school change

Research in recent years has validated that EI is significant in predicting a number of real-life outcomes , such as occupational and academic success and quality interpersonal relations, in a differentiated manner than general intelligence or personality do (Lam and Kirby, 2002; Petrides, Frederickson & Furnam, 2004; Petrides, Perez-Gonzales & Furnam,2007). At its most basic level, emotions can be viewed as occurring in people due to some sort of change in the world around them (Caruso and Salovey, 2004:9). Coping with change requires principals to exhibit emotional competencies to create emotional change sites of teaching and learning. When leaders drive emotions positively, they behave more flexibly, and have more confidence in their own abilities and the abilities of others, tend to think more broadly and creatively and bring out the best in people Caproni (2005:13). These leaders as resonant leaders, who know when to be collaborative and visionary naturally nurture relationships and create the human synergies of a group in harmony (Goleman *et al*., 2002:248). It is a lesson clearly observed in a study conducted by the American Express Financial Advisors (AEFA), which found a direct correlation between the EI of financial advisors and their workplace success (Fatt, 2004:189).

Aside from leaders at schools developing specific skills, including self-awareness, managing emotions, motivating oneself (channelling emotions into reaching a goal, self-control, delayed gratification), empathy and effectiveness in handling relationships they should endeavour to develop a set of generic core competencies in the school so that when a new challenge appears, the school can draw on these core competencies to build its own solution (Davies, 2004:231; Caproni 2005:13). Change initiatives do not run themselves, but require substantial effort to be devoted to such tasks as monitoring and implementation, keeping everyone informed of what is happening and taking clear coping action (Gulitg *et al.*, 2002:83).

Emotional competencies of principals for creating emotional change sites

To ensure success at schools, principals are cautioned to provide the management support to ensure that teachers and learners do things right while they focus on the leadership they provide (Sergiovanni, 2005:44). Consequently, the changing situation in education places particular demands on the principal and other senior managers at schools in South Africa to have the ability to manage multiple and ongoing changes and having a strategic overview, developing an agreed way forward in the interest of activities within the school to succeed. EI can have value to leaders working strategically in education and related fields as it offers useful skills form which individuals can select appropriately according to context, or can be trained to apply in certain situations Preedy , Bennet & Wise (2012:30, 57).

Six factors in terms of the transformational nature of principal's leadership that promote organizational learning is noteworthy namely vision and goals, culture, organisational structure, intellectual stimulation and individual support (Salins, Mulford and Zembalis, 2004:427). Leaders in the emotionally charged contexts of education who can draw on deep acting or spontaneous and genuine emotion, may well be considered most effective and gain the respect for teachers and learners. Such leaders must weave together EI competencies and have an understanding of their context and networks and show a willingness to perform emotional labour (Preedy, Bennett and Wise, 2012:60). In terms of leadership in education, emotional labour is defined as paid work that involves the expression and manipulation of emotions and regarded as a requirement to produce emotional states in others or exercise a degree of control over the emotional activities of others (Waddington and Copperman, 2006; Hochschild, 1983).

From a study undertaken at the Ontario Institute for Studies in Education, reflecting on how leaders experience, express, reflect upon and understand the emotionality of their work, Beatty (2004:186) concludes that leaders' emotional responses to perceptions about others' emotions and lack thereof, shape their behaviours and attitudes and that passion, purpose and determination are key to providing the emotional drive and force necessary to lead, even if you are the only one who can see the goal line.

METHODOLOGY

This study was conducted in two provinces in South Africa, namely the Eastern Cape Province and the Gauteng Province. Questionnaires were distributed to Grades 10 and 11 educators and learners of four secondary schools in the Gauteng and Eastern Cape Provinces of South Africa respectively. In each province, the schools used for the study, were categorised as either ex-Model C or disadvantaged. Leedy and Ormrod (2005:96) posit that quantitative researchers tend to rely heavily on deductive reasoning, beginning with a certain premise and then drawing logical conclusions from them The data for this study was analysed using the statistical package SPSS which stands for *Statistical Package for the Social Sciences.*

POPULATION AND SAMPLE SELECTION

The target population comprised of secondary school educators of all races and learners at South African secondary schools. To achieve the aims of this study, a representative sample, was purposively selected. Jones and Kottler (2006:66) states that in quantitative studies, purposive samples may be chosen because the researchers know (or at least think they know) things about the characteristics of people in the sample that would probably make them reflective of the target population.

DATA ANALYSIS

Questionnaires were handed to the participants personally and the responses were collected at a given time. Both the educator and learner questionnaires were divided into three parts which dealt with biographical data (section A); healthy schools (section B) and leadership and change (sections C and D).

Table 1 reflects educators' sentiments on EI and change management at a disadvantaged school in the Eastern Cape Province and the Gauteng Province respectively.

Table 1: EI and change management at two disadvantaged schools in the Eastern Cape and Gauteng Provinces

Item	Activity	Strongly Agree f (%)	Agree f (%)	Disagree f (%)	Strongly disagree f (%)	Missing f (%)
C110/C93	The leadership empowers learners and educators to implement change	54(46)	87(69)	58(63)	14(11)	40(30)
C111/	The school is successful because it has strong positive leadership	41(40)	41(40)	11(11)	2(2)	7(7)
C112/C96	The principal creates a caring environment for learners and educators	40(31)	109(86)	55(44)	14(13)	35(25)
C86/C102	The principal explains change by means of two-way communication	32(27)	100(83)	60(45)	24(19)	28(19)
C78/104	The principal prepares learners and educators to adjust to proposed change	36(31)	112(87)	55(43)	10(7)	40(30)
C82	Whilst implementing change, the principal provides opportunities for learners to articulate their feelings	66(55)	91(74)	47(35)	19(14)	30(22)
C111	The leadership maximises opportunities for educators and learners to reflect together on what is happening emotionally in their current relationships	23(54)	64(42)	23(15)	12(8)	29(19)

80% of the educators agreed that their school is successful because it has strong, positive leadership and 86% agreed that the principal creates a caring environment for learners and educators. However, 44% of the participants did not concur that the principal creates a caring environment. This does not augur well for the role of EI when managing change at schools.

Most of the educators (83% agreed & 27% strongly agreed) that the principal explains change by means of two-way communication and prepares learners and educators to adjust to the proposed change. However, 19% did not concur with the latter statement. The majority of the educators also indicated that they agree that the leadership empowers learners and educators to implement change (69% agreed & 46% strongly agreed) and that the leadership maximises opportunities for educators and learners to reflect together on what is happening emotionally in their current relationships (54% reacted positively). However, 8% of the participants did not concur with this statement. While the leadership generally motivates learners to assist with change at school and assists with the adjustment to change (87% agreed & 31% strongly agreed), 43% did not concur. Principals need to respond urgently to the challenge of change and encourage more ownership of the process by both educators and learners. Only 55% concurred that whilst implementing change, the principal provides opportunities for learners to articulate their feelings. 35% did not concur with this statement. What emerges from the change efforts adopted at the school is that the leadership should assist learners and educators in the adoption and implementation of plans for change. It therefore seems appropriate to conclude that there is a need for leaders within the school to assume a greater responsibility for effecting change successfully and to involve learners and educators in the process and to supply actions and strategies needed to effect the change.

Table 2 highlights learner perceptions regarding the role of the educator as manager of change, EI and workplace success and EI and change management.

Table 2 Learners at two schools outline the role of the educator as manager of change

Item	Activity	Strongly agree f (%)	Agree f (%)	Disagree f (%)	Strongly disagree f (%)	Missing f(9%)
B31	Learning takes place in a non-judgemental environment	73(53)	163(58)	33(25)	2(1)	8(4)
B44	Apart from imparting academic skills and knowledge, the school promotes the personal and social development of learners	4(2)	50(40)	141(79)	77(48)	7(3)
B52	Educators show care and concern toward learners at this school	88(63)	153(86)	25(20)	3(1)	9(9)
C69	The leadership espouses an open learning environment, conducive to change	103(81)	134(94)	24(16)	1(8)	17(7)
C70	The leadership of the school supports the full growth of learners academically, socially and emotionally	148(55)	94(75)	13(9)	6(5)	18(9)
C75	I feel emotionally safe at the school	56(43)	142(54)	49(35)	10(7)	22(11)

C88	Before implementing any change initiative, the principal gains acceptance from educators and learners first	95(73)	127(93)	23(9)	4(2)	30(16)
C95	The ultimate success of the school depends on the quality of the role the principal displays	31(44)	31(44)	7(10)	0(0)	2(3)
C100	Management prepares educators to face the challenges of change	79(56)	123(48)	35(21)	11(5)	30(15)
C107	The leadership manages the emotional responses of educators and learners during change	89(64)	124(87)	28(30)	4(2)	34(17)

53% of the learners strongly agreed that learning takes place in a non-judgemental environment, while 58% of the learners at the school agreed with this statement. Yet 25% did not share this experience. A disturbing result is that most of the learners (79%) did not believe that the school promotes the personal and social development of learners, with only 40% agreeing with this statement. 86% of the learners indicated that the educators show care and concern toward them. Only 20% did not share this view. It is evident that educators aspire to create more caring classroom environments which are commendable, as this improves learners' social-emotional skills and they feel more comfortable to approach and interact with educators.

It is also clear that the leadership at this school espouses an open learning environment which is conducive to change. 81% of the learners strongly agreed with this statement, 94% agreed and only 16% of the participants disagreed with this statement. Learners also indicated that the leadership of the school supports the full growth of all learners academically, socially and emotionally: 55% strongly agreed, 75% agreed and only 9% disagreed with this statement. Physical and emotional safety ranked high with the learners, as 54% agreed that they generally feel safe at the school and 43% strongly agreed. However, 35 % disagreed with the statement. When probed about change at the school and whether the principal gains acceptance from learners and educators first, before implementing change, 93% agreed that this was the case and 9% disagreed. 56% indicated that the school management prepares educators to face the challenges of change, while 5% disagreed and 15% did not respond to the question. As change impacts on the ultimate success of the school, the leadership team needs to consider this aspect carefully.

DISCUSSION

In order for the school to survive, the challenge to today's secondary schools is to be sites of emotionally intelligent interactions. The cost of poor emotional competencies can be high. For principals and educators, having poor emotional competency can contribute to lack of motivation, poor decision-making, conflict, depression, stress and aggression. The researcher deems all of these possible consequences resulting from a lack of EI as posing possible threats to a stable, safe school environment. The role of the principal as leader in the leadership of learning is pivotal as it involves a fundamental commitment to the change process and the creation of a sustainable learning community (MacGillchrist and Buttress, 2005). Educational change behaves as a complex system with multiple frames or elements interacting together as a system to produce non-linear interactions (Hoban, 2002).

An EI competency framework for change is proposed to assist principals to effect change at their schools successfully. It addresses the question of how schools can become emotional change sites of teaching delivery. This implies that the role of each participant in the change process and in the establishment of a sound learning culture in schools in South Africa is considered. Moreover, the literature supplied in this paper supports the arguments put forward for the components of the framework. The purpose of the EI competency framework for change is to transform the learning environment by addressing the process of change in an emotionally intelligent way. If implemented correctly the application thereof may significantly reduce stress and disruption associated with change. The framework depicts a successful school as containing important components of EI, a sound school culture and elements for leadership and change. EI in the framework is defined as a type of social intelligence that involves the ability to monitor, discriminate among and use information about emotions of the self and other individuals. Schools implementing the framework will enhance the educational experiences of learners and educators as its impact would significantly be felt in the classroom and how educators teach, learners learn and parents participate in their children's leaning. At the core of the EI Competency framework for change is the notion of a **successful school** that is built on four tiers, namely Educators' EI, sound leadership and sustained change which lead to an improved school culture. Although separate, these tiers interact to create a successful school.

Successful schools

Success is perceived as the achievement of something planned or attempted and mentions that success may never come without compelling personal commitment to something you care about (Porras, 2007). Successful schools are founded on three elements namely a sound, interactive school culture, principals being emotionally intelligent and the school engaging in change. One of the characteristics of successful schools is that educators talk about teaching. Change strategies need to help educators create a discourse about language for teaching. Educators need to engage seriously with one another's practice by sharing their own experiences and searching for shared meaning. In addition to focusing on learners' cognitive development, educators must also be prepared to address learners' continuing physical, emotional and social growth. Principals should challenge the traditional role of educators as providers of information and contribute to the creation of positive relationships and an educator-learner partnership. In the EI competency framework for change, the interaction of the principal as leader with the educators and his emotional awareness of how they perceive the process of change contribute to the overall success of the school.

Educators' EI

EI at school is a critical ingredient to effect academic and social performance. EI in the framework is defined as a type of social intelligence that involves the ability to monitor, discriminate among and use information about emotions of the self and other individuals. In order for the school to survive, the challenge to today's secondary schools is to be sites of emotionally intelligent interactions. The costs of poor emotional skills can be high. For instance, a lack of EI can ruin careers and sabotage achievement. For learners, having poor emotional skills can contribute to depression, eating disorders, unwanted pregnancies, aggression and violent crime. The researcher deems all of these possible consequences resulting from a lack of EI and social- emotional learning as these pose possible threats to a stable, safe school environment for the learner. Elias and Arnold (2006:6) argue for the

essential skill of social-emotional learning (SEL) which is sometimes called *the missing piece* because it represents a part of education that links academic knowledge with a specific set of skills important to success in schools, families, communities and life in general. The authors identify eight elements of SEL that create a strong connection with academic learning. These elements are based on one fundamental principle: effective, lasting academic learning and SEL are built on caring relationships and warm but challenging classroom and school environments (Elias & Arnold, 2006:6). The authors posit that it is a way of teaching and organizing classrooms and schools that help learners learn a set of skills needed to successfully manage life tasks such as learning, forming relationships, communicating effectively, being sensitive to others' needs and getting along with others.

School leadership

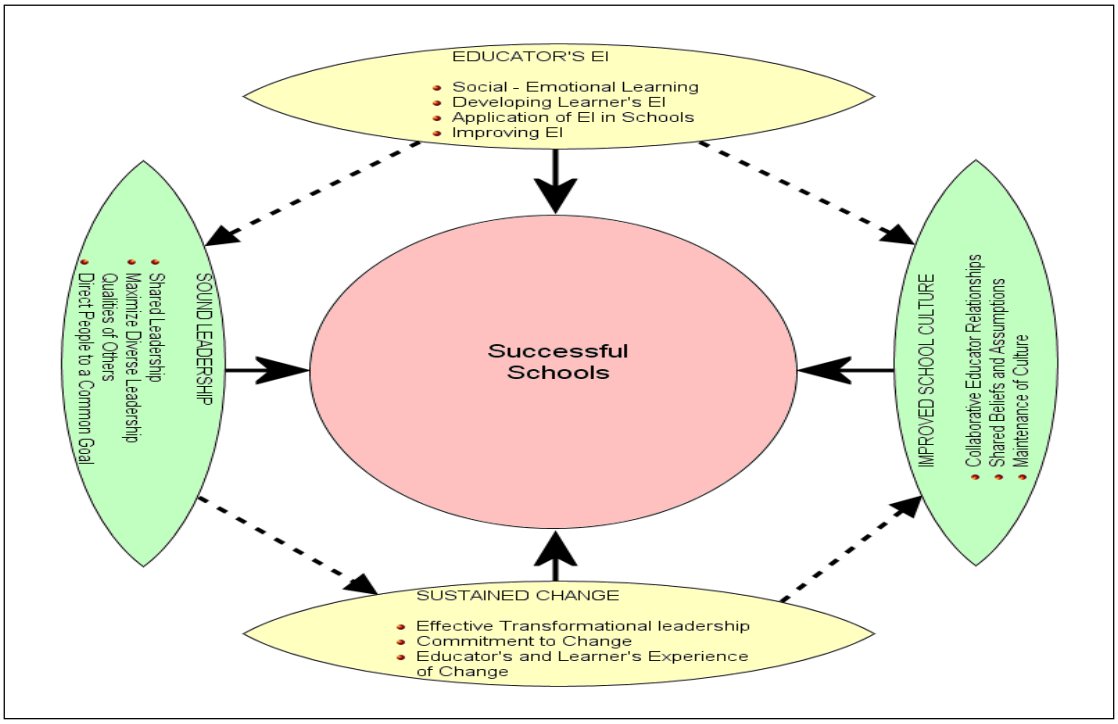
The principal as leader must build their own capacity and that of their schools which implies the creation of opportunities for growth and the need to collaborate with other leaders to strengthen their capacity to deal with change and improve on their practice. A necessity to shoulder wider roles that work for the success of other schools as well as one's own and realisation that in order to change the system one has to engage with it in a meaningful way (Davies, 2007:158). Working with neighbouring schools develops its own capacity – even successful schools can learn from struggling ones (Preedy *et al.,* 2012:260.)

Sustained change

Systematic forces, sometimes termed inertia, have the upper hand in preventing system shifts. Therefore, it will take powerful, proactive forces to change the existing system (to change context). This can be done directly and indirectly through systems thinking in action. These new theoreticians are leaders who work intensely in their own schools and at the same time connect with and participate in the bigger picture (Fullan, 2004; Preedy *et al*., 2012:254). In terms of the transformational nature of principals' role as system thinker involves leading and facilitating a revolution of pedagogy, understanding and changing the culture of the school for the better, relating the broader community, in particular with parents (*Ibid*.). This implies that if sustainable change is to be achieved it must be led by school leaders who apply system leadership as an emerging practice (Khan,1976; Senge, 1990; Campbell *et al*., 1994; Fullan, 2005 and Preedy *et al*., 2012:254).

Improved school culture

Principals experiences, emotions, knowledge, skills, motivation confidence and interdependence interact with the learning context in which they are located (Stoll *et al*., 2004:276). As founders of their school culture they should adopt strategies to generate and sustain culture and communicating its core values and beliefs to stakeholders (Bush and Anderson, 2003:97). For significant and sustained change to take place, principals should therefore cultivate a spirit of collaborative culture among stakeholders.



Palmer's EI Competency Framework

RECOMMENDATIONS

As schools brings together a mix of backgrounds, values, views of the world and personalities, the overarching message that comes through consistently is that principals should acquire emotion management competencies in order to deal successfully with the process of change in their schools. They should assess the learning environment and recognise the contributions each individual member can make to add to the success of change. Leadership gives educators more self-esteem and self-awareness and in indirect ways better instruction, although interpersonal factors are crucial (Harris, 2005). To a great extent those interpersonal factors are the same as the interpersonal factors at school level where principals act. This transformation is a fundamental change in school life and it is therefore not close to being implemented (Preedy *et al*., 2012). The fundamental message to principals is that they should encourage the promotion of positive relationships between educators, learners and senior management. Principals as leaders should ensure that people perceive themselves to be competent to handle the change process in an emotionally intelligent way and not feel overwhelmed and confused. Change should happen in a culture of learning and cooperation and although educators and learners alike may experience pressure to change, the support received from the principal will further stimulate and enhance any change initiative and empower everyone involved. Principals should therefore provide educators with the possible tools to respond to the demands brought about by change in the educational setting.

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Lesson Study in a Pre-Service Elementary Math Teacher Course

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Abstract
This paper seeks to demonstrate the ways teacher learning was impacted using the Lesson Study model. This case study takes place in a junior-level, pre-service teacher elementary math class. PST's taught classes of fourth and fifth-graders using a Lesson Study Model adjusted to meet the needs of both the PST class as well as the elementary classes. PSTs were grouped into pairs to design, plan and teach an age-appropriate math lesson, while remaining PSTs observed elementary students. PSTs collectively reflected in class with the instructor, and/or in journals. Data from these reflections as well as course feedback forms were processed and analyzed for impact in Pre-Service Learning. Results include greater preparation and assumption of teacher identities as well as confidence in the role which transferred into early cooperating teaching experiences. Peer feedback gave rich and meaningful opportunities for PSTs to reflect on their practice from many perspectives. Overall, the prodding students as bearers of information became an important aspect of their practice and was a constant theme throughout the data recorded. Portions of the paper will demonstrate how the Lesson Study model was orchestrated through community partnership. Much of the paper will contain quotes from students revealing some aspect of their learning in the process of using Lesson-Study.

Keywords: *Lesson-Study, Pre-service, Math, Partnerships*

Introduction:

In 1976, Schwarb described classrooms as "Learning Communities." Deborah Ball used this idea as a foundation in much of her research. In her paper, "With an Eye on the Mathematical Horizon: Dilemmas of Teaching Elementary School Mathematics" she demonstrated the dilemma of creating and using community in the teaching of mathematics. Aside from demonstrating the complexity of navigating a teacher's role and the use of time well spent, she demonstrated that over-reliance on community instructional methods or authoritative instructional methods for teaching renders the practice intellectually dishonest. That is to say that intellectually honest teaching, as addressed by Bruner in 1960, requires that the educator flexibly move into and through multiple strategies and philosophical dispositions to effectively teach (Ball, 1993). The work of teacher noticing has been widely engaged in scholarly work. Erickson states that noticing is an active practice, rather than passive (Sherin, Jacobs & Philipp, 2011). Stockero (2014) stated that it cannot be assumed that teachers will be able to notice productively. With the growing body of attention on teacher noticing and the training of teachers for noticing, it seems imperative to incorporate training for teacher noticing in Pre-Service education opportunities. One method for teacher training that prioritizes development of teacher noticing is the Lesson Study.

The Lesson Study is a Japanese style of professional development that cultivates teachers as problems solvers by learning in contextualized learning situations. As Kazemi, Elliott, Hubbard, Carroll, & Mumme (2007) stated, "Exploring mathematics with groups of people is

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inherently a cultural practice." Many have reported on the needed training of teachers for Culturally Relevant Pedagogy (Aguirre & del Rosario Zavala, 2013; Gay, 2002; Howard, 2003; Ladson-Billings, 1999; Lipman, 1995). The attention to context in addition with the prioritization of developing teacher noticing makes Lesson Study a potentially powerful tool in the training of Pre-Service teachers in better addressing student's zone of proximal development as well as acknowledging and confirming student's culturally unique ways of thinking about mathematics.

Design

The design of this project was born out of the reflective practices of teaching a pre-service math course. As a general practice, I have kept organized notes and examples of student work. In addition, I have incorporated multiple ways to give students power directing the course whether implicitly or explicitly. Implicit attempts were through listening or responding to assignments that had not or were not demonstrating the growth in PSTs that we were hoping to attain. Implicit attempts require reflective analysis of how the students are learning as you conduct your class. Explicit means were provided through interviews, regular feedback forms, and course evaluations. One long-time aspect of the class included a mock lesson where PSTs, in groups of four, developed a lesson and taught that lesson to peers. I had struggled in previous years with the uncertainty of whether the learning was authentic based on comments and feedback from the lesson. Additionally, there were frequent comments made in class, around the university, and in program feedback forms, where PSTs referred to learning in the University as theoretical and learning done in the field experience as "true" or "valuable." The combination of these events lead me to incorporate the Lesson Study model through partnering with a local bilingual classroom. When given a choice of days to teach, all PSTs in my class chose the day when the children would be coming. After multiple attempts to persuade PSTs to choose another day not a single PST changed their mind. It was here where I allowed the actions of the classroom to change the course of the class. I went to the school district to seek cooperating teachers who would allow a group of pre-service teachers to teach while the other PSTs observed students, a Lesson Study Model was altered to fit the Pre-Service Teacher. More information on the set-up of this class will be published in my chapter, "Designing a Co-Created Class: A Case Study of an Undergraduate Teacher-Training Class" which can be found in "Student-Focused Learning and Assessment: Involving students in the Learning Process in Higher Education" which is set for publishing in the spring of 2018. Data was collected in meetings with PSTs as they designed their lessons, in observing their lessons, and in the feedback, they received from peers as well as the cooperating teacher. Additionally, interviews were conducted and transcribed, reflection journals were analyzed, feedback forms were distributed, collected, and evaluated as well as the course evaluation forms at the end of the semester. Data was then compared to that which was collected in previous years.

Findings

Students revealed a perceptible change in the authenticity of the learning in Lesson Study. In an interview, PSTs explained how teaching opportunities in the context of peers as students didn't feel as rich or productive.

> PST 1: …and I just loved our whole class. With like the, uh, teaching kids.
> Interviewer: Yeah?
> PST 2: That was so cool.
> Interviewer: Yeah?

PST 1: We always had complaints going through this, like teaching college kids, there's like almost no point to doing that.

PST 2: [laughing] honestly, yes! We have done that so many times and it has just been like

Interviewer: [clarifying] You have to teach other…?

PST 1: Yeah

PST 2: Yeah. It's like we, we know how to add and subtract and multiply and like...

PST 1: It's not as authentic.

In ongoing class feedback forms with open response, the Lesson Study component became the most-mentioned topic having the greatest impact on their development as teachers. One PST wrote, "Things that have been working for me are being able to actually teach lessons. I was able to feel more confident with teaching math. Something that should happen in every class. I love this class." Another PST wrote, "I liked that we had the opportunity to work with students in our cooperating teacher's class and receive both peer and instructor feedback. I found this meaningful and helpful." And another PST wrote, "I really loved how we had the opportunity to teach actual elementary school students math before our placement. It was helpful to get feedback from the kids and from our peers." The Lesson Study provided multidimensional learning opportunities that made deep impacts on PSTs. This confirmed what was written earlier in their journal entry. A PST wrote about the Lesson Study performed that day, "this was definitely one of the most beneficial lessons I have ever been a part of. It was beneficial being both the lead teacher and the [observer]... We were able to see exactly what students struggle with and we were able to work with three very different types of students and see how they interact with mathematics and each other." One journal observed the multiple levels of learning that happened in this partnership, "There are so many opportunities for learning through this whole experience. The most obvious is the elementary students learning a new math lesson. The pre-service teachers conducting the lesson are learning from the students and themselves on how to be better teachers and what they would do differently next time they teach the lesson. Then the observant pre-service teachers are learning from the pre-service teachers teaching the lesson and the elementary students engaging with the lesson. One of the biggest perks of watching students being taught to is to see the things that happen "behind the scenes" if you will, that the teacher in the front of the classroom doesn't always catch. I learned that the students were a lot smarter and more capable than I thought they would be." As this journal entry demonstrated, PSTs could see how capable students were, therefore laying the groundwork for PSTs to trust the viability of productive struggling among students.

Additionally, PSTs noticed student needs and learned from the acting PST teachers in the Lesson Study. They wrote, "The classroom management was the most difficult part I would say. The students had a lot of math at this point and some of the boys were getting really rowdy. The teachers did a great job of getting the class back on track [by saying] "friends, you are not paying attention and it makes me sad." This PST reflected, "These types of lessons are so great because they are exposed to real life teaching and have to really implement classroom management." Another journal mentioned how they learned through observation that student involvement impacted the lesson. "I also noticed that teaching was so much easier and more enjoyable when I involved students- either having them go up to the board or responding." One journal wrote that they could practice continual assessment when they taught in a Lesson Study. "From teaching children, we are able to see what children struggle with and what teaching strategies actually work and which ones do not. We also are able to hear new and interesting student ideas about mathematics and just learn about the way students think. I think

that more of our pre-service teaching courses should strive to bring children in, and at the very least mathematics should always be taught like this." The opportunity to watch peers teach provided a window into their own teaching as an opportunity for improvement. Another journal read, "From observing and working with students I noticed their biggest struggle to be in classroom management. From observing the lesson, I made mental notes of times that I would have done something differently if I was standing in front of the class of students. One main problem [I] noticed is they had students take notes on a blank white sheet of paper. They should have modeled how they wanted it written and spaced for the students to take notes by writing it on a piece of paper with them and periodically holding it up."

PSTs also noticed that students had different ways of addressing or solving a problem. In one journal entry, a PST wrote that a student told her "when we do math in Mexico, we don't write the number we carry over, we keep it in our head because then it gets messy." The student went on to tell her that her mom teaches her math at home. This conversation provided a learning opportunity that made its way to her journal. Though the PST categorized it as Mexican ways of multiplying, which wasn't a true representation. She saw first-hand that students will have multiple ways to solve problems and some of these ways may be tied to their cultural knowledges. This may have been the first time the idea crossed her mind that students may have other ways of solving problems that a teacher must consider.

Several journal entries address what they noticed as observers verses what the teaching PST noticed. One journal stated, "There was a lot of confusion from the students but they never raised their hand and explicitly said so, so the teachers never knew." Another journal recognized how silence could give a false impression of understanding and therefore make it very important for teachers to consistently investigate student understanding in multiple ways. The journal read "[some] students who struggle are more quiet. If we didn't have so many teachers to help him out, he would've been struggling silently and the teacher might not have known at all. [He] didn't seek help." This PST was beginning to see first-hand that it cannot be left to students alone to communicate that they do not understand.

Finally, in addition to practical learning about classroom teaching, students felt a shift in themselves. They began to see themselves as teachers, moving from students to the professional community of pedagogist. In an interview this was clearly communicated:

> Interviewer: But if you were asked to make a tangible list of what you've learned…
> Student 2: yeah [affirming] …I'm more comfortable
> Interviewer: yeah, okay. So it, it's more internal feeling
> Student 2: um hmm [affirming]

This shift is an important one given the habits observed in early field experiences. There is often an observable timidity and sometimes a lack of trust in oneself as an educator. In instructor meetings, this problem was observed and discussed. Some instructors were curious if this timidity led to a lack of meaningful engagement in their early field practice. In turn, practical learning opportunities were missed because PSTs in the early field experience were reticent to sit with the children, preferring the more-safe space of the back of the room with peers. In this same interview, PSTs mentioned greater confidence in their field experience. At the end of the course, I received a thank you email from one student that stated "This has been the best math class of my college career, and have learned more through your methods than those of any other teacher! I have become so much more confident in my abilities to teach my

students math in fun and exciting ways." The writer went on, "I found that your insight on teaching, multiple opportunities to interact with children, valuable feedback, and motivation to keep our end goal/purpose in mind in helping us push through difficult times really helped me out in the [placement period] (and without a doubt will help me throughout my career)." The letter went on to say, "Additionally, I will certainly always remember this course because unlike all the other courses, not only this semester but my entire college career, I feel like I have grown as a future teacher and as a person." There may be more than just the Lesson Study with students that impacted this PST, but given over half of the comments received in the course evaluation mentioned the positive impact of the Lesson Study. The Lesson Study also provided opportunities for rich feedback, mentioned in this letter.

Overall, results demonstrated that teachers felt the task of the Lesson Study provided opportunities for greater preparation as well as the assumption of their teacher identities and confidence in the role. Some indicated that the Lesson Study directly impacted their cooperating teaching experiences. In addition, the role of the observer as well as peer feedback gave rich and meaningful opportunities for PSTs to reflect on their practice from many perspectives. The intentional use of students as bearers of information became an important aspect of PST practice and was a constant theme throughout the data recorded.

Recommendation

These vignettes offer a rose-colored look at the use of Lesson Study in Pre-Service teacher education. Much of this I believe stems from the uniqueness of the experience coupled with PST's excitement to become teachers. Though I did see general improvement in the teaching assignment and greater richness in reflections as compared to previous years, it must be said that this model has several downfalls in the implementation. Time and resource constraints make up a bulk of the struggle to implement Lesson Studies in the PST math course.

I left the public school setting just a year and a half before teaching this course. This scenario provided me with ample access to current teachers to invite into this case study. This piece contributed greatly to the project's feasibility. The partnership took a great deal of work from my cooperating teachers. They had to coordinate their teaching schedules to focus the hour needed for the Lesson Study in addition to travel time. In many cases, teachers are only afforded 30 minutes or less to teach a math lesson per day. Given the number of standards in every subject area, math is often put to the side to cover other goals. While some teachers saw this as an opportunity to expose students to concepts they would not be able to cover before their state exams, it still took time from other subjects they were racing to cover before the exams. While this pressure does little for teaching actual concepts, teachers have little choice but to follow it, especially new teachers who feel they are risking losing their jobs if their students don't test well. They had to take time from their busy schedules to meet with me and discuss details, dates and curriculum. They had to petition their principals for access to transportation and rooms in their building that would accommodate nearly 60 people. In return, the cooperating teachers reported that the experience was overall very positive. Since all cooperating teachers were in their first or second year of teaching they reported a realization of how far they had come, demonstrating a greater confidence in their own craft. One teacher stated "I forgot about the time when I wasn't sure how to get the students attention. I felt proud of myself, which being a first-year teacher, I rarely feel that." In addition, the cooperating teachers could see their own students in a new light, providing the same opportunities to observe students through the Lesson Study method.

Additionally, the transportation of students could be an issue but in our case, we had a district who had buses and drivers available for the transportation of students. This may be a larger problem in places where the university has limited access to local schools or where resources are scarce. Our class could come to one school for one day. Many students mentioned that this was one of their favorite days since they got to see the kids in their classroom context. We were offered a classroom to conduct the next two hours of our class. It became a bit haphazard since we didn't really have space needed. There was also increased time needed for moving the manipulatives we used into and out of the class.

In many ways, the Lesson Study ended up taking a large part of my class preparation time and created a lot of stressful situations. To make a model like this sustainable, there would need to be a school-district/university agreement that would connect the university to a set of teachers with support of their district. Within our University, we have been looking for ways we can continue the development of our graduated PSTs, furthering our commitment to them as alumni and to the districts who hire them. Amid budget crises, continued professional development may be a welcomed service for districts charged with the ever-increasing cost of PD.

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What is the Problem with Their Hair? Traces of Cultural (Ir)responsiveness in School Discipline Policies in South Africa

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Abstract

Recent incidences of perceived discriminatory practices involving the hairstyles of marginalised learners in particular, in South African schools, has resulted in a renewed focus on the nature and implementation of school policies. South African education policies are supposed to celebrate cultural diversity and promote unity. However, indications are that school policies are used to maintain unequal power relations and keep marginalised cultural groups in subordinate positions. Using Critical Policy Analysis, I analysed schools' Codes of Conduct to understand how particular discourses on culture are created and how issues of power and hegemony play out in the framing (or not) of *culture* in these documents and schools. This paper will therefore report on the ambiguities created by silences, contradictions and vagueness within these policies, as well as notions of hegemony, especially as it relates to pronouncements on student hair. I argue that nebulous and/or draconic pronouncements are deliberate, in order to maintain the status quo in schools, and that these decrees create space for the violation of the cultural rights of marginalised cultures. This paper concludes with recommendations on how policy can be more responsive to promoting culture and cultural diversity in schools.

Keywords: *Culture, Cultural oppression, Diversity, Learner discipline policies, South African education, Marginalised students*

Introduction and orientation

In September 2016, Black learners from a prominent South Africa girls' school protested against the school policy which, appeared to have been discriminating against them on the basis of their culture. Indications are that the school policy on learner behaviour, also called the Code of Conduct (CoC), banned the wearing of particular "Black" hairstyles (afros, cornrows, braids, etc.) as it was deemed 'untidy' and 'not appropriate'. In another incident at yet another girls' school in 2017, Black learners particularly, were apparently subjected to what is commonly known in the school as the "swimming cap test". Here, Black learners were seemingly expected to put on a swimming cap and if their hair could not fit under the swimming cap, it was deemed not in line with the CoC. Learners were then expected to shorten their hair. These are just a few examples where the CoC of particular South African schools, in one way or another appears to be unfairly discriminatory in nature. These incidences not only highlight the struggles of culturally marginalised learners, but also portray some schools as rather violent and culturally intolerant spaces where the cultural background

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and identity of some learners, their basic right to education and to non-discrimination is neither protected nor promoted.

The SA Constitution (1996: Preamble) aims to "heal the divisions of the past and establish a society based on democratic values, social justice and fundamental human rights." Drawing on this, education aims to "redress past injustices in educational provision … and [to] advance the transformation of society, combat racism, and sexism and all other forms of discrimination and intolerance … protect and advance our diverse cultures and languages…" (DoE, 1996: Preamble). With this vision, is expressed an education system which will promote and protect diversity and contribute towards tolerance and respect for different cultures.

SA schools are legally mandated to develop various policies which would give effect to this vision. One such policy is the CoC for learners. In general, the CoC is supposed to create a safe and conducive learning environment and to assist in transforming public schools into spaces of tolerance and respect for diversity. However, indications are that some SA schools are not safe and conducive learning spaces for *all* learners as they seem to use their CoC, and particularly the hair codes, to discriminate against learners from marginalised backgrounds.

In this paper I explore the extent to which the CoC of particular South African schools creates safe and conducive learning environments *for all learners*, by responding to cultural diversity within their borders. In this regard, I subject the CoC of particular schools to a critical policy analysis infused with elements of discourse analysis to expose traces of cultural (in)tolerance. I argue that the CoC of certain South African schools is not only perpetuating cultural intolerance, but that it is hegemonic in nature. In presenting my point, I will first clarify the concept 'cultural responsiveness'. Thereafter, I will problematise the issue of hair, after which I will provide my findings and conclude with some recommendations.

The concept cultural responsiveness

In this article, I use the concept 'culture' in its descriptive and anthropological sense – that is, culture as a whole way of life (Entwistle, 1978). I also draw on Banks and McGee Banks (2010) who link culture with language, dress, food habits, religion, values, norms and religion. Culture is therefore also intrinsically linked to identity (Kidd & Teagle, 2012). People's view of their hair could therefore be regarded as related to and informed by culture and is part of a person's identity.

In education, cultural responsiveness assumes the creation of learning environments that allow students to utilise their culture to enhance their schooling experience and academic success (Howard, 2012), as well as acknowledging the importance of maintaining a cultural identity and heritage to ensure academic success (Gay, 2000). It also assumes that "students are less likely to fail in school settings where they feel positive about both their culture and the majority culture, and are not alienated from their own cultural values" (Ladson-Billings 1994)). More so, cultural responsiveness is also about social justice that aims to identify and address inequities that exclude marginalised groups (Howard, 2010). Cultural responsiveness therefore, requires a validation and affirmation of cultural diversity; as it concerns social justice, it counters hegemony.

Culturally responsive policies take into account how decisions affect all students, even those who are typically marginalised (Klinger et al., 2005). As such, by being culturally responsive, the CoC will not only reflect a sensitivity for cultural diversity, but it will also validate, affirm and promote the cultural identity of marginalised learners and restore pride in their cultural identity.

The problematic nature of 'hair'

Hair and identity

For marginalised people, hair is more than 'just hair'. Rather, hair is of socio-cultural significance because it has spiritual, religious, status, ancestry and identity connotations (Johnson & Bankhead, 2014). Moreover, whilst hair is variously connected to self-identity and group identity (Weitz in Manning, 2010; Pergament, 1999; Johnson & Bankhead, 2014), women also have an emotional attachment to their hair (Manning, 2010). For Blacks, their hair is therefore part of who they are.

Hair is political

However, more than just being part of their identity, for Blacks the issue of hair is also political. As such, it is used as a means of social control and oppression (Pergament, 1999). Dash (2006) demonstrates how Europeans shaved the hair of enslaved Africans in an effort to dehumanise and break their spirit. In the USA in the past, hair served to determine where enslaved Blacks would work – those with kinky hair worked in the fields and those with a more Caucasian structure worked in the house (Robinson, 2011). In South Africa, hair texture was also used as a criterion for racial classification. Here the 'pencil test', mandated by the Population Registration Act of 1950, was used to distinguish between various racial groups, and to classify people based on whether the pen would stick or drop out of the hair. The outcome of the pencil test not only resulted in the particular racial classification of SA citizens but also in racial discrimination, oppression or the lack of privilege.

Hair as a means of expression

In addition, hair is also an important mode of self-expression, to communicate social messages and to object to the standards of the dominant culture. It should be noted that the messages of protest, alienation and freedom or non-conformity, pride, political empowerment communicated through the hair of punks, skinheads, hippies, the dreadlocks of the West Indies and afros respectively, are significant (White & White, 1995). Manning (2010) holds the view that women also use their hair as a form of everyday resistance from social norms established by the dominant culture.

The foregoing briefly demonstrates the significance of hair in society and the value it has for Black people.

Methodology

This study took up a critical stance towards reality and what is presented as the truth. As such, I adopted critical policy analysis (CPA) as a method of textual analysis, infusing it with elements of critical discourse analysis. My choice of CPA is informed by the view that policies are historically and socially situated and matured with the values of their authors (Torregano & Shannon, 2009). Conscious of the possibility that policy might maintain social

injustice, CPA also investigates the (mis)use of power in policy texts (Teise, 2013). In addition, CPA not only explores the use of language but it also highlights certain silences, omissions and contradictions in the policies (Taylor et al., 1997) that legitimise vested interests and values. Using CPA, I explored the hair policies of particular schools so as to determine whose interests they serve. By means of an analysis of the language used in framing issues of hair in South African education policies, I could determine the cultural (ir)responsiveness of some schools' learner disciplinary policies.

Data sources

As data sources I used the policy texts of ten different South African schools. These policies were randomly selected based on their availability on the internet. Since these policies are publicly available, I was not required to get formal permission from the schools to use the documents. I regard these texts as authentic and credible documents, representing a true reflection of the policy statements of these schools. For confidentiality reasons, the schools are not identified in the article.

Findings

The policy texts that I used are available both on hard and electronic copies. The documents contain various pronouncements which are supposed to create a safe and conducive teaching and learning environment. This article focuses only on pronouncements concerning learners' hair. From the text particular common themes were identified. However, since the context of the policy is important for its improved understanding, I will briefly outline the context within which these pronouncements were developed and their functions.

The context of these documents

In CPA and in discourse analysis, it is important to consider the context of the policies or text to be analysed. Taylor et al (1997) assert that every policy develops from and within a particular social, economic and political context. Policies are therefore contextual and historical documents. The selected CoC variously refer to the Constitution of South Africa, the South African Schools Act (1996), and other relevant education policies and legislation, as authoritative documents which not only informed but also mandated the development of CoC. The websites of these schools suggest that they are former Model C schools, and that their learner and teacher composition is predominantly White. These policies therefore reflect the social context and values of White South Africans. It is therefore fair to assume that the dominant culture in these schools is representative of White South Africans. It is further fair to assume that policies in these schools reflect the ideal of retaining White power and privilege and to maintain 'standards' in former White schools.

The content

The selected texts make various pronouncements about the following aspects of learners' hair: hair colour hair length; braid, extensions, dreadlocks; hair styles; and chemicals. These pronouncements will briefly be highlighted. CPA is also interested in the use of language, and in the silences and omissions in policies. In my analysis of the hair codes, I will therefore also reflect on these.

Hair colour

All policies are very clear that learners' "hair may not be tinted, washed with a colour, rinse-dyed or highlighted" and "girls may not alter the colour of their hair in any way". In addition, whilst "hair may also not draw undue attention as a result of dyeing", highlights are also not allowed. In cases where the hair rules are broken, some policies pronounce that "a girl will be required to restore her hair to its original natural colour".

Hair length

Concerning the length of hair, policies in general suggest that hair should "not touch the collar" or be "longer than shoulder length or below the eyebrows". Schools do not allow for learners "to wear their hair loose", "or down the sides of the face and head". Long hair should always be tied up. Certain schools have particular pronouncements as to where and how the hair should be tied back: "in a ponytail, no lower than the nape of the neck, with a navy blue elastic"; and "Ponytails may not be visible from the front". With regard to beards, schools are clear that a learner's "face should be clean shaven at all times". In some schools, learners are prevented from shaving their hair as the policy states that "no … shaving of hair in any way is allowed" and it also prohibits "closely shaven heads". Where braids are allowed, it is indicated that "braids shorter than collar length must be kept off the face …'' and that "longer braids must be tied back".

Braids, extensions, afros and dreadlocks

In some of the schools "'no braiding, plaiting, twirling, spiking, afro styles, undercuts or steps" are allowed. Although other schools do allow braids, they are allowed only on "condition that they are not more than 0.5 cm thick plaits using three strands to a maximum of approximately 35 cm long and all braids must be the same length". The CoC also states that braids should be "a maximum of 10mm in diameter", and is clear that "no big bows or fancy hair ornaments"; "no weaves or any other form of hair extensions, sewn or glued" are allowed. Whilst some of the school policies explicitly indicate that "no dreadlocks" are allowed, others provide for afros "no longer than 5 cms". Although some schools do not allow extensions, in other schools extensions are allowed, provided that they are "colour 4 and 6" and that they "must have a professional finish".

Hair styles

In some schools "eccentric/fashion styles" are not allowed and "hair styles should be conservative, neat and in keeping with the school uniform". Where cornrows are allowed, they "must run parallel from each other from the forehead to the nape of the neck. No patterned cornrows" are allowed. All schools do not allow "spiking of hair", and "fashionable hairstyles or any hairstyles likely to cause comment/distraction are unacceptable …". In addition, schools also do not permit "mod hair styles, e.g. punk or little curls or pigtails hanging down the back, sides, or on top of the head". Furthermore, "beads or decorations in the hair" are also not allowed.

The language used in the texts

The texts scrutinised use very strong, authoritative and prescriptive language which leaves no room for choice or alternatives. Words, such as "no"; "must" "will" are commonly used in the texts and in most instances, the sentences are short and direct. Certain words are

particularly used in reference to particular anticipated learner behaviour. For example, policies state that "**no** braiding, plaiting, twirling, … **no** afro styles … no undercuts"; "**no** dreadlocks"; "**no** headgear"; "**no** big bows or fancy hair ornaments"; "**no** weaves or any other form of hair extensions …" are allowed. Braids "**must** be the same length" and "**must** be the natural colour of the girl's hair …".

Assumptions in the texts

In various CoC particular assumptions about the learners and their hair texture are made. Some of the texts assume that all learners have the same hair texture and that their hair is therefore all the same. Examples of such assumptions are that the hair texture of all learners allows the hair to hang over the eyes and the collar. Another assumption is of course, that learner treat their hair chemically in order for it to be able to hang.

Silences and omissions

A number of silences were detected in the hair codes. Many CoC were visibly silent on issues of culture and diversity. In addition, CoC were also silent on procedures learners or their parents could follow to apply for deviations from the hair code. Where provision is made, a long process requiring written proof, documentary evidence and face-to-face interviews with the principal and SGB, is outlined. No policy explicitly validated or promoted cultural diversity.

Discussion

Although some schools in the above exposition appear to demonstrate a responsiveness for cultural diversity, the general and more pervasive discourse detected is that of cultural irresponsiveness. This irresponsiveness is couched within colour-blindness. Colour-blindness assumes that teachers "see children and not colour" (Jansen, 2004). In the process, race and culture is conveniently ignored. This is aptly demonstrated in the "neutral" way the CoC are written; some pronouncements are made in the assumptions about Black learners and in the explicit silences and deliberate omissions on cultural diversity and Black learners' hair. For Black learners braids, cornrows and afros are not 'fashionable' hair styles or hairstyles on which they want to draw "undue" comments or attention; rather, it concerns hairstyles unique to them. Not only are dreadlocks associated with a particular marginalised culture – Rastafarians – but Rastafarianism is also common amongst Black South Africans. By bluntly prohibiting these hair styles, schools send out messages of intolerance and cultural racism. Whilst, an explicit prejudice against Black culture and -hair is therefore observed, the CoC are overtly promoting the dominant culture. Giroux (1986) asserts that schools transmit and reproduce the dominant culture. Schools are therefore actively contributing towards creating and maintaining social inequalities. Thus, Apple (1990) is of the opinion that schooling and education is never a neutral enterprise, and Dallavis (2008) maintains that schools promote inequalities. This schools do by presenting "themselves as agents of freedom, but in fact are organisations of power" (Calhoun, 2003: 6). Therefore, although some schools in South Africa appear from the outside to be desegregated and integrated, from the inside. They marginalise and silence diversity by taking away the cultural voice of many learners. The danger thereof is that Black learners will experience and view their culture and identity as inferior.

For McLaren (2003) a link exist between the (in)ability of individuals to express their culture and the power certain groups are able to wield. Issues of power are therefore central to what is included or excluded from school's hair codes. It is with this power that the dominant culture is able to exert control over marginalised cultures.

The strong language, with which particularly those hairstyles and behaviour associated with Black learners are prohibited, together with the somewhat limiting pronouncements in the text, suggest a strong presence of social control in these schools. One could therefore regard CoC as one of the "strategies of power" (Foucault, 1988: 104) used by the dominant culture. The control of learners' hair exerted by some SA schools is therefore similar to what slaves in the USA and SA citizens were once subjected to.

In the texts, policy directives are framed within a discourse of so-called sanitation, thus prohibiting particular hairstyles as they are considered to be inappropriate; thus, what is regarded as appropriate, is determined by the dominant culture. For Gramsci (1971) this exemplifies cultural hegemony; the supremacy of the dominant culture is to be maintained through "domination" and "moral leadership". By defining and prescribing what is appropriate, CoC are covertly used in the process of hegemony.

Recommendations

The above discussion highlights not only the extent of cultural (ir)responsiveness of some SA school policies, but also the oppressive and discriminatory nature thereof. It also emphasises the extent of social control to which Black learners are subjected in some schools – control which is aimed at maintaining the status quo and counter social transformation. For schools in SA to promote cultural diversity and tolerance and to effectively contribute towards a transformed society, they need to acknowledge that culture is not an ahistorical and an apolitical concept but that it is used covertly used in education to discriminate and to exclude. They also need to understand the significance of culture for particular learners. With this understanding, schools need to develop a sensitivity for pronouncements, particularly with regard to learners' hair, made in policies, and examine the responsiveness of their policies.

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Lesson Study Aimed for Proactive Use of Mathematical Representation in Arithmetic and Mathematics

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Abstract

OECD-PISA has pointed out the following issues of Japanese children's problems about Arithmetic and Mathematics: Development Mathematical Thought and Mathematical Representation, and Proactive Learning etc.

In Japan, Active Learning is prevalent. But, Active Learning is the learning itself that Japan has done so far. Active Learning is to achieve high-quality learning at school, children to understand learning contents deeply, acquire qualities and abilities, and continue to learn actively throughout their lives. Active Learning is done to solve the problem already mentioned by "Proactive Learning", "Interactive Learning" and "Deep Learning".

The purpose of this research is to promote proactive of diverse mathematical representation to children and students in problem solving in mathematics learning, and what kind of instruction the teacher should give for Active Learning type lessons to consider by practice.

In the actual classes conducted, in order to utilize proactive representation, such as assignment to present to children, instructions for group learning, guidance on how to explore and strategies, instruction on usage of representation, time allocation of classes, preparation and ingenuity of a teacher's careful lesson were found to be important.

As a result of examination in this research, since the lesson is a teacher's work, it is important to do enough class planning, prepare enough classes, and let the children think by themselves.

Keywords: *Learning of Arithmetic, Mathematical Representation, Writing and Drawing, Proactive Use, Active Learning*

Introduction

To begin, OECD PISA and Japanese academic ability research shown that fostering Thought Force, Representation Force, Proactive Learning etc. are the main problems of Japanese children in terms of learning Arithmetic and Mathematics. The teacher wants to enable children to describe how they arrived at a certain solution through the following points: way of thinking, way of solving, judgment. It is clear that it is important for children to write when they study Arithmetic and Mathematics. Teacher want to make practical use of diverse mathematical representation. The teacher wants the children to use proactive mathematical representation, even if the teacher doesn't tell them to do so.

Focusing on writing, Shimizu (2012) identified two difficulties preventing children from writing which are caused by its characteristics. The author also showed a viewpoint to overcome difficulty. The author considered fundamental and basic studies towards proactive mathematical representation. Eventually, Shimizu (2013) expanded from the basic difficulty of writing to the complicated difficulty which includes Illustrative Representation, and reconsidered guidance that encourage proactive use of mathematical representation. Shimizu (2015a; 2015b) discussed the point of contact between writing and truth. However, in order

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for children to make a proactive use of diverse mathematical representation, clear teacher's guidance is necessary. Actually, "Diverse Mathematical Representation" in this paper includes the same representation form by conversion of the Representation System in Mathematical Education of Nakahara (1995). It is a mathematical representation for finding out clues of assignment solving and their solutions. The ability to use many kinds of representation by children is "Diverse".

In Japan, Active Learning is prevalent. Apparently, Active Learning is a learning style that Japan has been doing since a long time ago. The said way of learning is to achieve high-quality learning at school. Children understand learning contents deeply, acquire qualities and abilities, and continue to learn actively throughout their lives.

The author would like to encourage children to proactively utilize diverse mathematical representation in solving assignment in Arithmetic and Mathematics learning. The purpose of this paper is to examine what kind of instruction the teacher should give for such preferred Active Learning type of lessons from the lesson study.

The method of research sets a hypothesis based on previous research. Based on the hypothesis, concrete lesson will be examined then a class will be conducted. Next to that will be the analyzation of the result then, finally, a teacher guide would be proposed.

Preceding Research and Research Hypothesis

Active Learning is done by "Proactive Learning", "Interactive Learning" and "Deep Learning". Then, appropriate Active Learning is important. The author considers the research hypothesis about teacher's guidance for classes of preferable Active Learning toward proactive utilization of diverse mathematical representation.

Oyama (2010), Nakahara (1995), and Shimizu (2015b) described reciprocal relations of thought and representation. An example of this, Oyama (2010) is conducting research focusing on mathematical understanding, and describes to relate diverse things about understanding, such as cognitive thinking and representation. Shimizu (2015b) is based on "utilization" including thinking and writing, children's thinking is done before the representation by child, trial and error by thought and representation. Shimizu stated that better representation will be made as a result of trial and error by thought and representation as reflective thinking plays an important role. From these, thinking and representation become active as activities related to trial and error become active.

Emori (2016) states what he wishes to activate is "the desire to learn" and "the thought of each child". Emori regards Active Learning as a new learning method that combines emotion and cognition as well as understanding and cognition. Emori is indecisive whether the questions of faculty stimulate learner's thinking, therefore, important factors to make assignment-solving lessons should follow.

Shimizu (2013) is studying guidance that encourages proactive use of mathematical representation including Illustrative Representation. And, Shimizu proposes guidance at three stages of learning: (1st stage) Teacher teaches children knowledge and effectiveness of mathematical writing, (2nd stage) Teacher makes use of mathematical writing, (3rd stage) Teacher casually prompts children to use and utilize mathematical writing, and solves the assignments through collaboration. In this way, with the guidance of the teacher, the learning of children can be seen gradually increasing "Learning → Utilization → Exploration".

Arithmetic and Mathematics Working Group (Ministry of Education, 2016) shows the roles played by the learning process to foster the qualities and abilities of children in order to revise Japan's next education guidelines (Figure 1) . In this model, there is a gradual development that can be seen through the enhanced language activities in each scene and in

the process of each which can be reviewed, evaluated and improved.

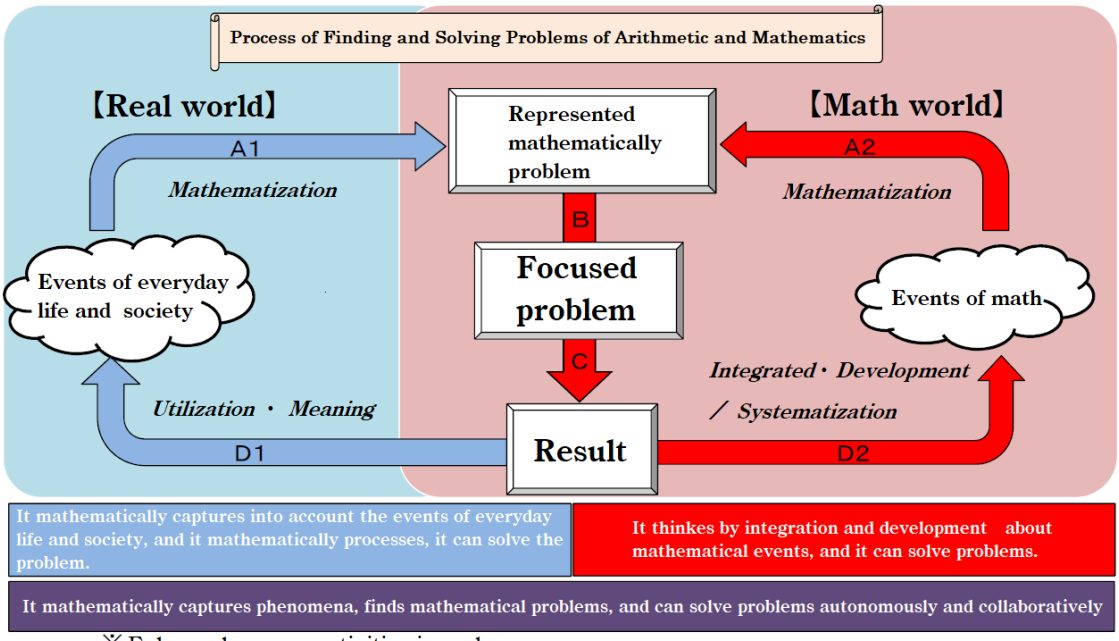

Figure 1. Process of Finding and solving problems of Arithmetic and Mathematics (Ministry of Education, 2016)

Looking at the previous research, teacher guidance is a rewarding lesson for children, and in the process of assignment solving, children are asked to reflect on their questions by trial and error through thought and representation. Furthermore, it is important for children to gradually increase thought and representation, including emotion. In other words, the teacher wishes that letting the children to ask questions, do trial and error, and have a sense of truth can encourage proactive use of diverse representation.

Active Learning has already been implemented in Japanese classes. Moreover, Japanese teacher are aiming for “Deep Learning”, “Interactive Learning” and “Proactive Learning”. In the previous research, classes such as creating reflection, doing trial and error investigation, obtaining active and truthful feelings are important views for proactive learning and proactive utilization of diverse mathematical representation.

The hypothesis in this paper states that children will use a diverse mathematical representation, by means of making trial and error for children and making the sense of truth in exploratory assignment solving. It is one of the factors of a preferred Active Learning type class.

Lesson Study

(1)Lesson Planning

Special classes that will be implemented were planned based on the “Number of Cases” targeted at first graders of high school. Teacher prepared new contents and new assignments so that children will not depend on textbooks. Therefore, we decided to conduct special classes not based on textbooks. Along with, the classes are going to be the extension of the contents of the textbook.

The lesson is about circular permutation and rosary permutation. It comprises of lessons as shown in Table 1.

Table 1. Unit Composition for Special Class

Period	Content of Study
1st	Think about a method of arranging them in a circle and a method that can be done by connecting balls
2nd[At Time]	Think about how to paint color on the dice front side

Many Japanese textbooks describe circular permutations, but there is no official description of rosary permutations. This class deal with rosary permutations as contents for developing circular permutations. Also, it is expected that many children knew about pearl permutation. Therefore, based on the situation of the children, teacher planned an assignment for painting the color of the dice front side (Table 2).

Table 2. Content of the Assignment

Assignment 1
You have to paint colors and the colors should be different on each side of the cube. How many ways can you paint it using all six different colors?
Assignment 2
You have to paint colors and the colors should be different on each side of the cube. How many ways can you paint it using all five different colors?

(2) Actual Class

In this lesson, we conducted Assignment 1 and Assignment 2 in 50 minutes. The following is the actual class report.

Assignment 1: Application of Circular Permutation

At first, I studied by individual activity. However, children naturally started to consult their classmates because of the degree of difficulty of the assignment, and therefore, it became a collaborative learning. Therefore, the teacher urged the children verbally to further promote solving the assignment by collaboration. Children tried the trial and error method from the early stage. And I saw the children's conversation and context, remarks and descriptions such as “Where do you think we should fix the front side of the dice?” Interesting conversation is better to write down because it is difficult to solve the trial and error by just thinking (Table 3). These children arrived in an idea to paint color and pictures, and write symbols using a child's box of a pencil case of a rectangular parallelepiped.

Table 3. Children's Communication that Children will not Understand Assignment Solving Unless Written by Children

S5: I must draw a solid figure and I felt confused on how to do it. I cannot imagine it.
S6: So I decided to color it blue and red.
S5: Decide.
S6: Then turn it upside down.
S5: Upside down.
S6: It is a different direction. So here, over here.
S5: That's why it's OK to change the direction.
S6: Change each direction. Do not flip it upside down.
S5: Keep on turning it but just turn it once inside.

S7: Confusing! I do not understand it at all.
S6: I do not understand it either.
S5: It turns into the same way when turning over. Turning this over···.
S5-S7: Ha,ha,ha···.
S5: There is no choice but to write···.

Therefore, the teacher distributed a print of the cubic floor plan and thought. Children have a time to think individually with nature. Children can make cubes and sketches. Children use cubes and sketches to think logically, which is enhanced by writing, drawing and talking.

On the basis of their activities, children reexamined the answer and answer methods on the print at the initial stage, and many children reshaped them. In this way, this lesson spent their solving skills using diverse representation within 35 minutes out of 50 minutes.

Assignment 2: Application of Rosary Permutation

After presenting Assignment 2, teacher asked the children "Can you think about this assignment by making use of something you have learned so far?" This query is for inquiries of children, in order to promote trial and error. By the query of this teacher, the children will be trying the utilization Assignment 1 and previous lesson's thinking (Table 4).

Table 4. Children will Feel the Necessity of Writing

S12: I may not able to do it because it is a circular permutation, it is a different one.
S13: You must fix the bottom, change the side, and turn it over.
S12: Then, it changes to a different form. I think it will not change.
S13: That is not because the color there is different. Hey, I can not explain my thoughts.
S12: Here it is. I will turn it over. And oh, it's still the same. You have the same top and bottom.
S13: The way of turning over is different.
S12: Front, sideways.
S13: This way, this way of turning over. This is like. Blue and green. Blue and green. Blue and green···, look at this···. No, it is. Understood? I understood. Look at this, look at it like this. Look at this, if you turn this over like this, I guess it's not gonna be the same···.
S12: (Laugh) No, it's not!
S13: Well, I guess it is like I understand, but I really did not understand.
S12: Look at the premise. Premise.
S13: It is bad, I can't think because I did not make a note.
S14: Oh, are they not changing?
S12: It is not the same as before.
S14: It's changed. It is now the opposite.
S12: 1, 3, 2, 5, 6. I wonder how you can overthrow this. I want to do this for this. I guess. Oh, this is useless. No, I want to do the same. It was unexpected a while ago, oh, here is the opposite.

At the beginning, children were thinking mainly by thought and conversation, and they did not do much writing. However, children began to feel the limit to the activities of thought and conversation only. As a result, it seemed that the children were writing. Together

with the teacher's query, this activity gives the time for children to try the trial and error method with themselves and make their own query.

Teacher took the remaining 3 minutes for the lesson and briefly summarized it at the end of the lesson. And, children wrote what are the things they learned from the lesson today.

(3) Analysis

Children were doing writing activities following the distributed prints. (Figure. 2).

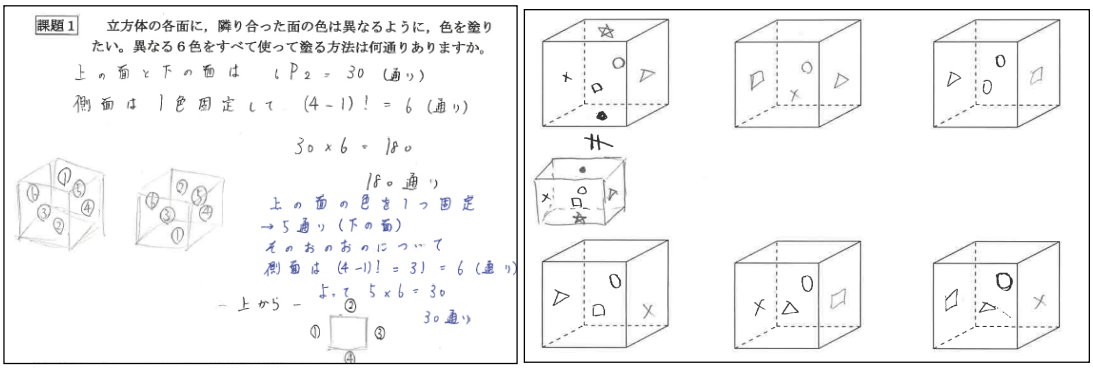

Figure 2. Printing the Child's Written Process of Assignment Solving

Children used Linguistic Representation such as Japanese, Illustrative Representation such as drawing in pictures, Symbolic Representation by Mathematical symbol. It seems that children are solving assignment by utilizing diverse mathematical representation on their own initiative. As I saw in the previous section, I seem that even in actual classes, we are using diverse mathematical representation. The impression of children's learning is written as follows (Figure 3).

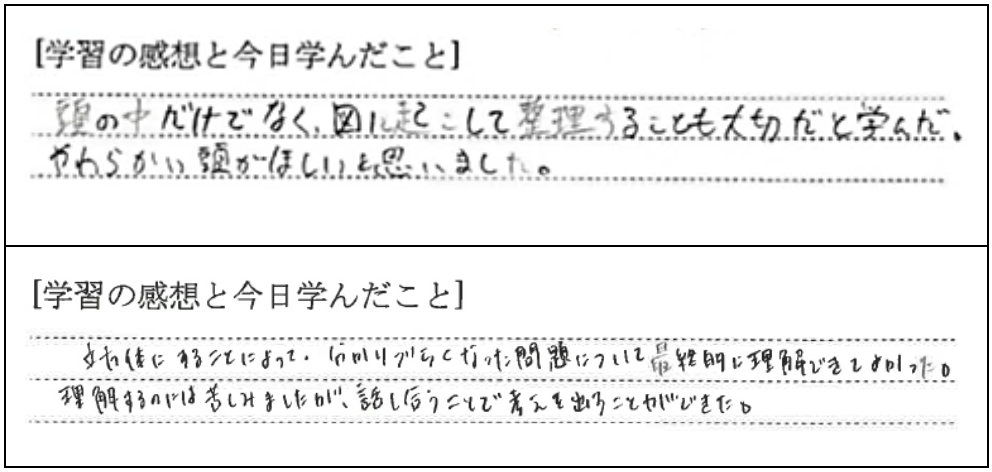

Figure 3. Children's Learning Impression

The learning impression of children in Figure 3 is stated as follows; "I learned that I should not only put my thoughts into my head but also organize it in figures and illustrative", "It was okay to finally understood the assignment that it became so difficult to understand by making it into a cube, I suffered in confusion, but I was able to think out by talking about it".

For Japanese classes, writing is urged to write. However, in this lesson study, by devising intellectual fun in assignment, a method for collaborative learning, guidance on how to explore and how to write, etc., to proactively utilize diverse mathematical representation, from these, good results will be produced. A good outcome is a situation in which children try

to do the trial and error, explore, make their existence obvious, and resonate. On the other hand, there was a problem in time allocation, which affected the trial and error of children. Thus, it was found that sufficient preparation and ingenuity of the teacher's lesson are important. Teacher thinks that trial and error method deepens by further giving children time to think freely. Teacher methods are also important in teaching the children. However, refraining the children from the teacher's method is important for children to practice "Proactive Learning", "Interactive Learning" and "Deep Learning".

Final Remark

As a result of the examination of this study, towards proactive diverse practical use of mathematical representation, it is important for teacher's guidance to make children do the trial and error, and to have a sense of truth in exploratory assignment solving. For preferred Active Learning classes, since the lesson is a teacher' s work, it is important to do enough class planning, prepare enough classes, and have activities that let children think by themselves. On the other hand, it is important for teacher to refrain from teaching the children and let the children think and work by themselves.

Appendix

This paper publicizes reconstruction through major revision and written based on opinions and questions from many researchers, at the 46th research presentation meeting held in Shiga University of the Japan Academic Society of Mathematics Education.

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Learning Strategy for First Grade Special Need Students in Inclusive School

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ABSTRACT

Inclusive education system has been developed in Indonesia several years ago. Inclusive education is implemented well when all students attend and are welcomed by their neighbourhood schools in age-appropriate, regular classes and also are supported to learn, contribute and participate in all aspects of the school activities. Inclusive education as a process of providing education effort that override the constraints of all children in learning. The provision of education can be the procurement, management, facilities, curriculum development and implementation of instructional design. All must be met for each school implementing inclusive education. The purpose of this study was to obtain information and data at the most detailed and deep understanding of learning strategy of first grade special need students in inclusive elementary school 04 Menteng Atas, South Jakarta. The subjects were students and teachers first grade. The method used is qualitative research. Data was collected by documentation, interviews, observation. The results showed in the planning stages of teachers using the curriculum model of duplication, lesson plans are integrated, and assessment. The problems experienced by the teachers are the high number of students in the class and also the lack of knowledge about special need students experienced by teacher. Factors supporting or minimizing the barriers that exist is the reception is not through online channels and media that are considered sufficient teachers.

Keywords: *Learning Strategy;Special Need Students;Inclusive School*

Introduction

Inclusive education is one of the government-run program in the field of education, which is expected to give a lot of change to the world of education in Indonesia, especially for children with special needs. This relates to the Indonesia's Ministry of Education Regulation Number. 70 of 2009 dated October 5, 2009 on Inclusive Education for Learners and Students with disabilities who have the potential of intelligence and / or the Special Talent by the Ministry of National Education. The article explained that inclusive education is a different kind of education that provides educational services for children with special needs in accordance with their potentials and can be served in regular schools.

Inclusive education as a process of providing education effort that override the constraints of all children in learning. The provision of education can be the procurement, management, facilities, curriculum development and instructional design implementation. All must be met for each school implementing inclusive education.

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Researchers focused on how the learning strategies that teachers do in the class on the Indonesian languange subject. When the class is a beginning class in which the child enters primary school level. Kids should get the maximum service of basic skills in order to proceed to the next level. In the first grade level teachers to focus on reading and writing skills. Such skills must be mastered child because the child at the next level to meet with subject matter that require these skills. When reading and writing skills children have not mastered the next level of a child's difficulty in understanding and accepting the teacher's subject matter. The ability to read is needed in understanding how the child will understand the content of reading when the child can not read the text. Child learning strategy for the crew would have been very different from the other common children. Special needs students has a different classification would require a different learning. Researchers will restrict reading lessons for crew members are in school inclusion. Read on its behalf should be modified in learning methods, media, and techniques that can make a child to master as much as possible about the material read. This is where the importance of Indonesian Languange subject in class , so that teachers obliged to have a strategy in deliver good material in Indonesia Languange subject and in accordance with the individual needs of students, especially for special needs students.

Researchers are also interested to learn more about how the application of learning activities in inclusive elementary school 04 Menteng Atas models is in terms of planning, process, and evaluation on its behalf by a first grade teacher in learning Indonesian. Preliminary studies researchers found the condition of the class have not fluently read and write while the lessons to be dominated pupils already require two such capabilities especially in the Indonesian Languange. There are 5 special needs students similar constraints. There are also 3 special needs students in 2 class studying in class to learn to read.

Regular students in class have not been so well read at the beginning of school, but through the teacher's learning a little bit of their progressing quite well. Their ability to read manifold. The ability to read is still in the stage of spelling, reading haltingly, to already know how to read. This ability is seen when the child was the first semester

Literature Review

Igor Ansoff(1990), defines strategy as the management process, the relationship between the company and the environment, consisting of strategic planning, planning capabilities, and change management. Of all the theories above it can be concluded that the strategy are all efforts and steps, judgment abilities, strengths, and weaknesses. Inside there will be consideration of the ability of the strategy, strengths, shortcomings. Ability as a preparation to face or achieve a goal. Strength themselves or opponents should be careful consideration so that what the objectives can be achieved. Similarly opponent's shortcomings and should be considered to remain vigilant and so when encountering a problem to find the best solution. Everything is very important in the effort to achieve the goal of a person or group in.

According to Kemp (1995) explains that the strategy of learning is a learning activity that must be done teachers and students so that learning objectives can be achieved effectively and efficiently, while Dick and Carey (1985) also mentions that the learning strategy is a set of materials and procedures for learning used together to inflict on student learning outcomes.

From the above definition can be concluded that the learning strategy is a procedure or a series of learning activities that take advantage of teacher resources to achieve specific educational goals. Teachers should be good at making *setting* ropeeffective in the learning activities for the purpose of learning can be achieved.

Cited by wina Sanjaya, according to Davis (1996) explains that the planning of teaching is work done by a teacher to formulate the purpose of teaching.

Broadly speaking, planning is a series of preparation that teachers to teach students in order to guide teaching and learning activities currently underway. In the planning itself there is a media preparation, teaching materials, teaching objectives, making asesment instrument, making the curriculum, etc. The process is a word derived from the Latin is "processuss" which means "walk forward". The idea is that the process is one step toward a goal or a step for progress. the learning process is a set of core activities that teachers do in order to achieve learning objectives. It will also include teacher interaction with students and the implementation of the plan that has been designed teachers.

Cited by Syafruddin, according Dimyati and Mudjiono (1999: 1990) evaluation includes evaluation of learning outcomes and evaluation. From the above theory can be concluded that the evaluation of a series of activities to assess all activities conducted in pembeelajaran terms of both development and management.

Children with special needs is a child that is in the process of growth / development significantly (significant) anomalies / irregularities (physical, mental, intellectual, social, emotional) compared with other children his age so they require special education services. Of these restrictions can also mean that, even if a child has abnormalities / certain irregularities, but abnormalities / deviations are not significant so that they do not require special education services, the child is not including children with special needs.

Classification of children with special needs there are various depending on the viewpoint that is in use. For the purposes of inclusive education, children with special needs will be grouped into nine types as follows: (1) Blind / visual impairments; (2) Deaf / hearing impairments; (3) Quadriplegic / movement disorder; (4) Retardation of intellectual ability; (5) slow learner child; (6) children with learning disabilities; (7) Gifted and talented children (have exceptional ability and intelligence); (8) emotional and social behavior disorder; (9) children with communication disorders.

Understanding inclusion for most educators is an attempt to unite all students regardless of obstacles. According to Fuchs in David Smith stated that inclusion is *"full*inclusion"or *"uncompromising"* which means the elimination of special education. Inclusion that will be discussed in this book is more directed at education for all the obstacles that make it possible for them to follow. For some people the inclusion is seen as providing the opportunity for students who have physical barriers.

There are several different views. For the majority of educators inclusion is leveling educational opportunities in regular class without understanding that when students who have a bottleneck still require special handling, while now it might happen to teachers who organizes inclusive education, school education providers inclusion teaching staff provided with training of inclusion itself. when there are some paradigm of people about inclusive schools only for those who have physical barriers alone, this view will occur in society in general are very lacking in understanding of inclusion itself and they just look at it in terms of physical barriers. For those who know it will be of the view that not only the physical barriers he knew, and the recipient students with barriers into regular schools is not limited to acceptance, but all students who have barriers to its classification should get an education that suits their needs and allows it to be accepted in school inclusion.

Methods

This study used a qualitative approach is intended to determine human behavior and in-depth reason is the cause of such behavior. Research conducted on natural objects, objects that normal involve, and the researcher's presence does not affect the object studied.Using this approach, researchers studied what happens on the pitch in depth. Researchers examined how teachers accept and serve the diversity of student are common children and son crew, which includes planning, implementation, evaluation, and what are the obstacles and support in learning Indonesian Languange in the class.

Finding / Analysis

Based on the research in inclusive elementary school 04 Menteng Atas was done, researchers divided them into two, namely, curriculum and learning programs are made. Researchers analyzed the results of observation, interviews and documentation of how the plans made inclusive elementary school 04 Menteng Atas in the curriculum and learning programs. From the analysis of the data obtained as follows. Implementation at inclusive elementary school 04 Menteng Atas, researchers divided into five categories, namely, the interaction of teachers and students, the method used by the teacher first grade, the media used by teachers first grade in learning Indonesian, the material provided in the Indonesian lessons in class, and the process of learning Indonesia Languange in class.

Inclusive elementary school 04 Menteng Atas using diagnostic tests, tests of formative and summative tests in learning Indonesian Languange. Diagnostic tests end the teacher do when the teacher learning, before ending learning teacher to repeat the material being taught as a teacher in the students ability remarks. Teacher formative tests done, this test looks at the daily test of the student as reference material the teacher to know the extent to which the control children. Summative tests performed teachers and shadow teacher each semester.

In any event we definitely find resistance and support, as well as in inclusive elementary school 04 Menteng Atas. Barriers to learning in inclusive elementary school 04 Menteng Atas, especially in class was a disciple inclusive elementary school 04 Menteng Atas is too much compared are general, Teachers who are not from the background to the scientists of special education, concentration of children is always changing, and the general public perceives the school organizers inclusion inclusive elementary school 04 Menteng Atas is a school for children who are less academically.

Recommendations

Based on the research and analysis of the data, we conclude several things including learning are planning, implementation and evaluation. In planning the curriculum and lesson plans are. From the perspective of the inclusion of the curriculum used in inclusive elementary school 04 Menteng Atas is the inclusion of a model curriculum duplication. This means that the curriculum between students and the general student equated special needs students. Even though the teachers revealed that there is no differentiation curriculum manufacture, but actually now used curriculum in inclusive elementary school 04 Menteng Atas is the type of curriculum differentiation duplicate models.

Making the lesson plan in class , is a type of lesson plan integrity. In this curriculum include measures for student teachers and students special needs students public. Modification of media, materials, activities, and types of teacher evaluations

done. Bleak curriculum does not know theoritically teacher but the teacher to implement it. In making the lesson plan integrity of teachers make it on their own initiative because seeing the child's needs and abilities of students.

Assessment in class created as a means to identify the needs and abilities of students. Assessment carried out by shadow teacher, who assisted the informant as a teacher. Information obtained from the psichologassessment, information of parents and teachers as a teacher in class. Assesmentmade to the crew within a period of 6 months.

In the researchers examined the implementation aspects of the method used, media, materials, and processes that teachers in combining methods, media, and materials. The methods used by teachers in teaching Indonesian adapted to the conditions of the students, the material will be given to students and the media. In practice teachers use question and answer method, demonstrations, and lectures.

The media used by teachers in learning Indonesian is a letter media card, said card media, and special boards supplied media to stick to the letter card. Media that exists is the result of its own teacher-made and is already used by teachers in each lesson.

In any teacher learning material entering the charge read with a certain technique. In completing the teacher training student worksheet reading while charging. In huruf.guru sound material entering the charge read by writing a word that sounded and ask the child to read.

In the process shown how the strategy of teachers in gathering methods, media, materials, and strategies for teachers in learning. initial activities teachers undertake an explanation of media-related purposes, and material. Teachers provide the stimulus that what will be done is a game. Core activities in language learning is the teacher to enter the charge read any material with a Discussion of the method, demonstrations, and lectures. Teachers provide reinforcement in the form of praise when the student can follow the lesson well. against teachers are very lack to provide reinforcement because special needs students slow in understanding learning, and not infrequently raise his voice teacher when students are slow to accept learning. Occasional teachers around to check the tasks assigned students and coaching if required. At the end of the activity the teacher closure to repeat all described and assign tasks for homework at home.

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Critical Self-Reflection for PGCE Students: a Case of Micro-Teaching Practices at a University of Technology in South Africa

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Abstract

In this paper, the critical, reflective self-assessment of Postgraduate Certificate in Education (PGCE) students after their micro-teaching sessions is explored. During the first and second micro-teaching sessions, student teachers attend to the pre-lesson phase and the actual teaching with a focus on the mastering of skills such as lesson planning, use of teaching media, management of classroom activities and questioning skills, among others. In return, student teachers are provided with written and face-to-face feedback or a video recording as a third option. These three approaches are employed by lecturers to assist student teachers to critically reflect on their own progress and practices.

The questions that the study pursues are: To what extent are these PGCE students able to critically reflect on their own teaching experiences within a micro-managed and pseudo environment? How can this critical self-reflection assist PGCE students with their future teaching trajectories?

This study used a qualitative research approach. A purposive sample of eight students was selected with the aim to broaden the understanding of self-critical assessment within a micro-teaching context. A structured interview strategy was used to collect data which was later analysed categorically into different themes according to the items responded to by the students.

The findings from the interview analysis show that PGCE students are able to apply critical self-reflection as a skill to enhance and confront teaching problems. Furthermore, the study reveals that PGCE students find it challenging to critique themselves using video-recordings.

Keywords: *critical self-reflection, micro-managed, micro-teaching practice, PGCE students, university of technology*

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Introduction

The Postgraduate Certificate in Education programme is offered at many South African universities as a professional teaching qualification. The programme is presented over a period of one or two years to full-time and part-time students respectively. Students who are admitted to this programme have primary qualifications in the form of a wide variety of bachelor's degrees and three-year diplomas, without a background in education or teaching foundations. The challenge lies in systematically orientating them to the teaching profession. The swift adaptation and socialisation of PGCE students as teachers remain a critical challenge, among others. Thus, micro-teaching sessions are used as a catalyst to accelerate and adapt PGCE students to teach within a secure and unthreatening environment using different modes of teaching skills (Thakrar, Wolfenden and Zinn, 2009:5). Accordingly, one may view micro-teaching as a micro-managed teaching laboratory for student teachers to hone their teaching skills and for professional purposes (Dervent, 2015:266).

At one university of technology in South Africa, micro-teaching sessions are scheduled four times a year, once every quarter of the year. Student teachers' teaching exposure may include the use of chalkboards or whiteboards, integration of posters, the use of models and the use of overhead projectors to clarify the subject that is taught (Tripp and Rich, 2012:680). Furthermore, student teachers are also exposed to the management of the classroom environment in such a way as to ensure that imminent and simultaneous learner needs are attended to. Consequently, it is envisaged that micro-teaching will be a helpful scaffold for PGCE students to deal with a more demanding macro-classroom environment in a real school where there are a variety of learner challenges. Against the backdrop of the above-mentioned, this research study is focussed on the ability of PGCE students to critically assess themselves to enhance their teaching skills.

According to Richards (2010:110), reflective learning could be assumed to be an active and deliberate process through which a teaching experience is recalled, considered and evaluated in relation to a particular question the student teacher may harbour regarding his or her teaching abilities. As such, reflective teaching may further be described as a self-confrontational process where the student teachers take a hard look at their professional trajectories with the sole purpose of improving mastering the teaching environment amid fears of failure and weaknesses. Elucidated, self-reflective learning could be regarded as a high-order cognitive process where the student teacher, as teaching practitioner, evaluates his or her past experiences and decides on what to do better or differently in the future (Maarof, 2007:2017; Graham and Phelps, 2003:3).

The rationale for reflection suggests a deliberate and voluntary effort that a student teacher could engage in order to establish a set of beliefs upon his or her practice of teaching (Trede and Smith, 2012:620). Kinsella (2007:396) refers to Schon as a scholar who focused on rational reflection within the understanding and development of professional practice (Kinsella, 2007:396). The basis of Schon's rational reflection is to improve professional practice, assuming that such a process will lead to a state of expertise in that particular field.

Boud (2001:2) reasons that student teachers should be allowed the space to express their personal emotions in order to confront the perplexity of the teaching practice. In advancing the agenda for reflective learning, Habermas suggests that critical reflection should be the basis of transformative learning for the student teacher (Lucas, 2012:2). Critical reflection suggests that

student teachers should be conscious of the intrinsic challenges in their teaching spaces (Morrow, 2009:14). In this way, by critically reflecting, student teachers are liberated from the limitations of their teaching spaces and enabled to negotiate supporting spaces, rather than reproducing those inhibiting spaces. Lipp (2005:94) and Fleming (2007:659) suggest that liberating reflection embedded in critical reflection allows the student teacher to explore situations in which he or she felt disempowered with the aim of facilitating empowerment with the eventual emancipation.

The research aim and question

The aim of this research study was to explore the self-reflective assessment practices of PGCE students against their experiences in a micro-teaching environment. The following research questions guided the study:

- What modes of critical self-reflection are employed by PGCE students after micro-lesson exposure?
- How do PGCE students frame their critical self-reflection?

Research design and method

This study investigates the naturally occurring experiences of PGCE students during their critical self-assessment in the micro-teaching milieu (De Gagne and Walters, 2010). A phenomenological interpretivist research approach was adopted for the study. This approach seeks a deeper understanding of the modes of critical self-assessment that PGCE students use rather than to generalise the findings of the study. Terre Blance, Durrheim and Painter (2006) have the view that studied realities – in this study's context, those of PGCE students' assessment of their professional teaching trajectories – acknowledge subjective experiences. Within the framework of this paradigm, participants are free to provide insights on their own practices as they are probed and able to reflect on their positions and teaching philosophies.

Participants and setting

The participants of this research study were PGCE student teachers from a university of technology in South Africa. Eight participants with ages between 23 and 28 (five female students and three male students) were chosen to take part. They did not have any teaching experience prior to their admission to the PGCE programme.

Data collection

A structured interview was used to collect data from the eight PGCE student teachers. The aim was to establish a focused conversation on critical self-reflection after a micro-teaching experience (King and Horrocks, 2010) in order to determine their subjective views regarding fears of teaching, how they confront their own fears and their future aspirations as professional teachers (Silverman, 2008; Flick, 2010:16).

Procedure

The participants in this study consented individually (Kvale, 2010:45). They were informed of the study's aim, objectives, research method and the importance of their participation. In order to ensure data trustworthiness, the method of interpretive validity was applied where the

researcher and the researched mutually described and constructed their experiences of micro-teaching and self-reflection (Golafshani, 2003:598).

Data analysis and discussion

To ensure that the collected data produced findings that described the critical self-reflective assessment of the participating PGCE students regarding their micro-teaching experiences, a thematic data analysis was employed (De Vos and Schulze, 2002:45). The validity of the themes was substantiated alongside the literature control referencing related to critical reflective learning and micro-teaching experiences. The following were the key themes that developed from the analysis:

Theme 1: Modes of critical self-reflection

This theme arose from the question: How do you reflect on your micro-teaching experience? In general, there are various ways through which a student teacher can reflect on personal learning experiences regarding aspects such as teaching methodologies, learner involvement, different learning contexts and assessment strategies. Methods may include the use of reflective journals, group discussions, blogs and portfolios (Taole, 2012:3).

In this study, the participant PGCE students all used a portfolio of evidence as a recording tool of their learning experiences. When probed further, it was discovered that there was little on self-critical assessment, and only reflections on actual events that occurred in the classroom. In the context of this study, this finding implies that lecturers who are responsible for micro-teaching should be encouraged to make deliberate efforts to make student teachers aware of the importance of including critical self-reflection in their portfolio of evidence.

Another finding was that without critical self-reflection, participant PGCE students could not demonstrate their resilience against the teaching challenges they were confronted with in micro-teaching situations. Furthermore, other modes of reflection such as watching the video recordings, group discussions and blogs should be included in the student teachers' assessment of their portfolios of evidence.

Theme 2: Linking teaching theory and practice

This theme sought to establish whether PGCE student teachers are able to link the teaching theories they have been taught to their teaching practices during the micro-teaching processes. This theme emerged from the question: What is your view of the importance of the application of teaching theory to your actual teaching practice?

Studies done by Korthagen et al. (2001:2) demonstrate that there is a huge gap between teaching theory and the application thereof among student teachers. Ramsden (2003:62) concludes that student teachers use their inductive teaching methods.

The findings of the study under this theme highlight the importance of orientating PGCE students towards a variety of teaching theories and their application to the actual teaching practice. All of the student participants interviewed showed obliviousness of the importance of theoretical application to their teaching practices.

Conclusion

This research study highlights the importance of enhancing the skill of critical self-reflection in the teaching practice. This is done against the framework of the training of PGCE student teachers at a university of technology in South Africa. The aim is to make student teachers aware of the fact that their teaching practices are not void of embedded philosophical teaching influences and must be appreciated as such. The findings of the study accept the brevity of the PGCE teaching programme and its intensity. The study further suggests that other modes of reflective learning should be encouraged among PGCE students.

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The Implementation of Transition Program for Autism Children in Junior High School 4 Sidoarjo

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Abstract

This research had purpose to expose the implementation of transition program for autism children implemented by Junior High School 4 Sidoarjo with the principle of Direktorat PKLK Dikdas (Directorate of Special Education and Special Services). Based on the pre-eliminary study in December 5th, 2015 there was an indication that the transition program to autism students in the school involved into school extra-curricular program. This research used the descriptive method of qualitative approach and the technique of data collection used are observation, interview, and documentation, while the data analysis of descriptive qualitative used the phase of data reduction, data display, and verification /conclusion drawing. This research result indicated that in implementing transition program for autism children, integrating transition program was done by establishing structured extra-curricular and the program of self developing in the form of handicraft and clothing science i.e. twice in a week for 2 hours per week and when the students got leisure time while food science involved in sub-subject matter of vocational implemented once in a week suitable with the plan of learning implementation which was arranged by the teacher. To support the transition program, the school had tried to cooperate with DUDI (Industry and Trade World) i.e. shoes trade but it did not get any response yet from the DUDI. The evaluation of transition program for autism students was orally done by GPK (special education teacher) and the partners. The evaluation established by GPK was uncertain depending on the development of the autism students during the transition program given.

Keywords: *Autism Children, Transition Program*

Introduction

Readiness school tuition in entering the workforce need to prepared so that the graduates of the education can fill the needs of employment opportunities in accordance with the demands of developing. Hence, program the transition to after school for school tuition important since they was school suitable to the character and the level of education. Transition program the not only to students normal but also to school tuition needs special. So are students autism. Students autism difficult in terms of communication and social interaction and play imaginative who have been concerned that they are age 3 years (Priyatna, 2010:2). Based on the study of a precursor on 5 December 2015 at school inclusive who became school representative pilot school inclusive in Sidoarjo, and the subject that in accordance with research referred to, namely junior high schools 4 Sidoarjo. There were indications transition program for autism students at the school entrance extra-curricular school program. The son of free to choose extra-curricular according interest and talent they. And a number of programs entered into school curriculum.

The directorate guidance PKLK basic education (2015:15) said that the purpose of transition program the schools to after school, aimed at to prepare need students particularly

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in SLB or at school regular to independence after school. The target of the program transition according to the directorate PKLK basic education (2015:15):

a. Need Children particularly in the SDLB and primary schools the implementation of education inclusive .
b. Need children particularly in the SMPLB and junior high schools the implementation of education inclusive .
c. Need children particularly in the SMALB/SMKLB and SMA/SMK the implementation of education inclusive

The directorate guidance PKLK basic education (2015:73-74) said that implementation transition program the school state of the another

a. Self-reliance program: competence that must be controlled by learners in proposing yourself, gradually showed up with the independence of the development and growth (corresponding old).
b. Program vocational skill competence: pertaining to the job or products and services. Programs conducted gradually and in accordance with the development and growth learners to have competence vocational as victuals in continuing school level higher or plunge into the community.
c. Soft program: personal skill that improve the interaction of individuals, performance and career prospects.
d. Entrepreneurship program: covers activities that needed to create or execute company at the moment all the market is not formed or not yet identified with clear, the function or production of these components not yet fully known.

School education providers inclusive must meet the requirements as the insurer inclusive good education appointed by the government and on its own initiative receiving and giving the education services for learners with special needs disabled athletes (PDBK). And so transition program to be prepared for carefully by the school students to prepare to the world of work or higher levels.

Similar research is based on research conducted by Yaeda (2011), that the transition for children with special needs disabled athletes in Japan prepared by the school to bring the students told a better life. Program in transition formed cooperation between the family, school, work and society. Counseling family, counseling school, counseling and counseling community career, counseling progress and counseling rehabilitees collaborated on prepare the entering the workforce.

Literature Review

Transition program for autism students must be strengthened So after school they are ready to continue higher education Or in the world of work. This is in line with UU RI No. 4/1997 Regarding the rights and opportunities people with disabilities chapter 14 that:

“A state and private provide the opportunity and equal treatment to children needs special In his company conforming to a type and the degree of disability, education and ability, Whose numbers adjusted to the number employees and / or qualification company”.

According to a government regulation republic of indonesia no.43 /1998 about efforts to increase social welfare chapter 28 people said “Companies should hired at least 1 (one) people with disabilities Who qualified office and qualification work To companies for every 100 workers in the company.

Government regulations which has been regulated in act of course give a great opportunity for autism students can work. Students autism need to furnished with expertise vocational and expertise life vocational skill and life skill). Vocational education and training made the schools will make autism students become more competitive in the environment and independent.

Method

1. Design Research

Study was conducted by the kind of research qualitative. In a kind of this research used the qualitative descriptive. The researchers choose qualitative this case study by researchers want to obtain information on the implementation of transition program for students autism and evaluation carried out by the schools about the program transitional they apply.

2. Data and The Data Research

a. Research Sites
Study was conducted in one inclusion the state, SMPN 4 Sidoarjo inclusion pilot as school district and a school Sidoarjo inclusion by accomplishments good.

b. Subject of Study
the subject of study relating to implementation of transition program for students autism, consisting of a principal, for inclusion, chairman of inclusion, special education teacher and students autism.

3. Data Collection Techniques

Engineering data collection to be used in research is:

a. Observation in doing observation, researchers conducted observation both inside and outside class classes relating to transition program for autism students. From preliminary data this observation, researchers will get preliminary data on the implementation of transition program. The data include: transition program, and equipment available at school, The business world and industry (DUDI) cooperation with the school, evaluation.

b. Interview in this questions submitted directly, but directed free. The interview used to get data on the implementation of transition education at school. Speakers in an interview this is headmaster, for inclusion, chairman of inclusion, special education teacher considered knows autism son manners .

c. Documentation in this research, documentation covering:
   1) The transitional do by the school for students autism
   2) Note the development of students autism compiled by teachers a companion specifically.
   3) Photos activity that is related to the transition education for the autism

Findings/Analysis

Of the exposure to data research findings, obtained a thoroughly on the implementation of transition program for autism students. More specifically based on focus research on the concept, program, implementation and evaluation transition program, after implemented data analysis that obtained data:

1. The Concept Of Transition Program For Students Autism

The concept of transition program for autism students according to informants is give additional subject out academic particularly to improve their interests and talents students with the vocational so that they have sufficient to autism students when pass could be independent. While transition program according to the coordinator inclusion (ADM) is the where of elementary school to the junior high, where oil these moves be more students service.

The results of interviews with special education teacher (GPK) that program concept culinary according to informants is how food processing be food or just half finished from planning to the presentation of. This shows that understanding the concept of culinary special education teacher (GPK) SMPN 4 Sidoarjo there are conformity with the theory that is.

The results of interviews with informants special education teacher (GPK) that program concept of clothing science is the design make clothing of planning to packaging. It was related to the statement Ernawati, dkk (2008) of clothing science but is weak. Program concept of culinary according to Ernawati, dkk in 2008 not only function as processing or the creation of clothes of design until just packaging. But of clothing science closely related to choose, set also improving clothing science order to obtain clothing science more matching and beautiful. What this demonstrates the concept of clothing science according to informants is weak right but still relating to the theory about the concept of clothing science .

Based on interviews, the concept of handicrafts according to special education teacher (GPK) is craft functions which blends of design and beauty by modifying. This has to do with the theory about handicrafts expressed by was, Mike (2012) but still lacking Because informants did not mention the craft the way.

Further information about the concept of culinary, the clothing science and handicrafts, further research conducted in autism students class 7, 8 and 9. The concept of culinary autism AY according to students, the FT, HY, FD various but no connection with the theory program concept culinary according to Sunarsih (2008). Because the culinary is SMPN 4 Sidoarjo this is included in the art projects sub subjects. So autism students do not know regarding the concept culinary. According to the concept of clothing science AY and FT about the clothing science is the way into the processing. While according to the concept of clothing science FD is using batik. With do not know what the clothing science . What this demonstrates the concept of clothing science according to some students autism relating to the theory but flawed.

The concept of handicrafts according to AY is recycling / craft become a thing , while the concept of hand skills according to HY is sewing, and FD revealed that handicrafts is shake hands. While use the concept handicrafts is a craft made by hands .The concept of handicrafts delivered by the FT was, Mikke (2012) about handicrafts While others do not understand regarding the concept handicrafts. According to the interviews, this shows that informants know the concept of transition program for students autism well in accordance with transition program guide post school of the directorate PKLK basic education. But regarding the concept culinary, the clothing science and handicrafts. Only a few informants looking well, however there are also did not well understand culinary regarding the concept, the clothing science and handicrafts.

2. Transition program for students autism

The directorate coaching PKLK Mohammad (2015:73-74) said that the transition program schools among others included the independence, the program vocational skill, the soft skill, entrepreneurship program. Based on the study observation, interviews and documentation with the school principal (MC), inclusion coordinator (ADM), Chairman of Inclusion (GR) and special education teacher of Seventh grade classes (PPT), special education teacher of eighth grade (KRS) and special education teacher of The ninth grade (IZH) revealed that vocational program for autism students of provisions of clothing science and handicrafts as paint, make batik, drawing, embroider, knitting and sew. In preparing the transition program for students autism in SMPN 4 Sidoarjo this special education teacher (GPK) do initial identification and assessment to know the advantages and disadvantages autism students, later the teacher was preparing the program adapted to interest and talent autism students. It is like a statement direkotar PKLK (2015:15) is a transition program and charge after school to be adapted to the development of a career students, obstacles learning and special needs students.

This shows that transition program for students autism done by schools are in accordance with written by guidelines of the directorate PKLK DIKDAS vocational program. But programs done vocational done schools are only the clothing science and

handicrafts. With culinary included in the curriculum as sub subjects the art projects. Culinary lessons called in the art projects management. In learning this, autism students be hours of its own but within regular students. In the program handicrafts cover of clothing science. Ironing fabric of to be made batik, sew patchwork, sew craft of cloth flannel.

Meanwhile on evaluation transitional made the schools to get a response from informants diverse. Like in argue by the principal (MC) the evaluation implemented ideally in a month. Inclusion coordinator (ADM), chairman of inclusion (GR) that is revealed that evaluation transition for students autism held in the first school inclusion it is just a semester once. According to special education teacher (PPT), special education teacher (KRS), special education teacher (IZH) revealed that evaluation transition for students autism done erratic, like a student autism named AY and fD can make its needlepoint for 3 times in 1 month but back to students.

Based on the study observation, interviews and documentation revealed that evaluation transition for students autism exercised by junior high school inclusion is done by special education teacher is uncertain, depending on the autism students. So that they could not targets. While evaluation is schools in half once was evaluation thorough about the program schools that has been done to students autism. Evaluation is schools in half this time with bring parents of autism student. Described the school autism students in half.

3. Transition program for autism students

Direktorat PKLK Dikdas (2015:73-74) said that implementation of transition program in school among independence program, vocational skill program, soft skill program, entrepreneurship program.

From the interviews, observation and documentation to headmaster (MC), chairman of inclusion (GR), special education teacher of Seventh grade classes (PPT), special education teacher of eighth grade (KRS) , special education teacher of The ninth grade (IZH) Said vocational l skill program for autism students In the form of clothing science and handicrafts as paint, make batik, drawing, embroider, knitting and sew.

In arrangement of transition program for autism students in Junior High School 4 Sidoarjo, special education teacher do early identification after that do assessment for know Excess and weakness autism students. Then teachers arrange a program adapted to interest and talent autism students. This similar with a statement Direkotar PKLK Dikdas (2015 :15) said type and contents transition program post school to be adapted to the development of a career students, Learned and obstacles special needs students.

This condition shows that transition program for autism students who is done by the school is in line with shown by a guide of Direktorat PKLK i.e vocational program. But vocational program as made the schools limited only of clothing science and handicrafts. While Culinary included in the curriculum as sub subjects the art projects. Culinary in art projects called management. In learning, autism students autism not got individual learning but study together with regular student. Into program handicraft exist clothing science program. Like Ironing fabric that will be made batik , sew patchwork , sewed crafts of flannel cloth.

While on evaluation transition program has made the schools get response who came from various informants. i.e headmaster (MC) that Ideally evaluation carried out in a month. Coordinator of inclution (ADM), chairman of inclusion (GR)That is revealed that evaluation transition program for autism students only one half once. While special education teacher of Seventh grade classes (PPT), special education teacher of eighth grade (KRS)Revealed that evaluation of transition for autism students done erratic, i.e

AY and FD can make product Needlepoint for 3 times in one month but it's get back to students.

From the interviews, observation and documentation is evaluation program for autism students do by special education teacher is uncertain, depends autism student. So, special education teacher can't make target. While evaluation do by school in one semester once is all evaluation about school program who already done for autism student. Evaluation in one half once invited parent from autism student. School show development autism student in one half.

4. Implementation of transition program for autism students

Transition program done to prepare students with special needs in unmainstream school and mainstream school to post school independence. It is no exception by autism students. Transition program for autism students must preapare for independence needs economy post school that began when they are in school benches.

From the interviews, observation and documentation to headmaster (MC), chairman of inclusion (GR), special education teacher (PPT), special education teacher (KRS), special education teacher (IZH) Said the transition program was done inclusion junior high school is handicraft Covering paint , make batik , drawing , embroider , knitting. In the handicrafts covering of the ironing batik fabrics, sew patchwork, sew flannel etc. While culinary entered into sub subjects the art projects. Who conducted together with regular students. Inclusion coordinator (ADM) adding transition program has done the school admission process is autism students, assesmentand services such as regular students in the learning process. Then special education teachers determine focus for autism student and give vocational program for them.

In the implementation of the transition Program at the Junior High School 4 Sidoarjo is form program structured extra-curricular and self development program. Transition program in form of clothing science and handicrafts for autism student i.e twice in a week, 1 hours on Wednesday and 1 hours on Thursday for 2 hours per week and when the student got leisure time. While culinary included in sub subjects the art projects carried out in 1 week 1 times with regular students was done according with lesson plans subjects the art projects made by art projects teacher. Based interview, observation and documentation result, This shows that transition program of clothing scienceand handicrafts for autism studentsWho made the schools are in accordance with written by guidelines of Direktorat PKLK Dikdas i.e the transition program done through the extra-curricular structuredWith allocation of time 2 hours per week.

One of the important to support the transition program is cooperate with the Business World And Industry (DUDI). This cooperation to support learning through observation, practices, internship, and work distribution.From the interviews, observation and documentation to headmaster (MC), chairman of inclusion (GR), special education teacher of Seventh grade classes (PPT), special education teacher of eighth grade (KRS) , special education teacher of The ninth grade (IZH) SaidThat junior high school inclusive has been trying to cooperate with the Business World And Industry (DUDI). Efforts to cooperation was conducted schools to DUDI including by means of sending proposals to business shoes.Until now has not received a response from parties the shoe business. Initial plan school when conducting cooperation with Business shoeswere that students received training from the business.

Inclusion coordinator (ADM) adding That in addition to cooperation with business shoes.Schools also make relation with batik industry. That business give Training for teachers about how the way to make batik. And teacher teach to students. For the best batik result sewn by students. This conduction shows that schools had make effort to make relation with DUDI but there is no a replay. It's means autism student who have.

Certain skills not yet distributed by the school. About that of existing infrastructure Junior High School 4 sidoarjo that carried out a transition for autism students the results of interviews with informants. It's revealed informants about facilities and infrastructure are varied. Headmaster (MC), chairman of inclusion (GR), special education teacher (PPT), special education teacher (KRS), special education teacher (IZH) Said Facilities and infrastructure that provided of them was the provision of vocational room, therapy room, 1 unit of a sewing machine, five sets of batik, 10 unit computer, 1 unit of instrument for make pin, 2 unit electronics (avometer and soder), 1 unit of instrument canvass. special education teacher of The ninth grade (IZH) adding there is help to 1 unit of instrument needlepoint.

Coordinator of inclusion (ADM), chairman of inclusion (GR) said Facilities and infrastructure of vocational in Junior High School 4 Sidoarjo Had already been each therapy for autism students. And than, special education teacher said Expressing media , the tools learning and vocational in accordance program made by special education teacher they are adequate in the service for autism students.

The school has a budget of funds special for Children with special need and the school submit a request for assistance to be equipped. From the interviews, observation and documentation, in general Facilities and infrastructure in Inclusion Junior High School 4 Sidoarjo Enough to complete in implementation of transition program for autism students. Transition program structured according with programs that taught by teachers. It's means Facilities and infrastructure in transition program for autism student has supported of transition program for autism students as maximum as possible.

5. **Evaluation of transition programs for autism students**

Based on observation study, interview and documentation of evaluation of Implementation program for autism students implemented by GPK (special education teacher). Evaluation of clothing science and handicrafts was done orally among GPK (special education teacher) and other GPK (special education teacher). Evaluation of Implementation was done GPK (special education teacher) not same, depends student ability. See students when taught could work or not, GPK (special education teacher) only Set an example once or twice. If students felt able, the program will be continued. Being culinary the sub subjects the art projects, Evaluation was done in Once half.

Recommendation

In the implementation of the transition Program at the Junior High School 4 Sidoarjo is form program structured extra-curricular and self development program. Transition program in form of clothing science and handicrafts for autism student i.e twice in a week, 1 hours on Wednesday and 1 hours on Thursday for 2 hours per week and when the student got leisure time. While culinary included in sub subjects the art projects carried out in 1 week 1 times with regular students was done according with lesson plans subjects the art projects. Facilities and infrastructure transition program for autism students in Junior High School 4 Sidoarjo was already adequate programs made by GPK (special education teacher).

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Lecturers Reflections on a Lesson Study Open Class Session held at a South African University: Considerations for the Teaching of Division in Primary School Mathematics

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Abstract

This paper sought to explore the teaching of division administered to grade three learners during a Lesson Study Open Class session held at the Central University of Technology, South Africa. Research in Mathematics education has prompted a move towards subject experts collaborating to improve teaching and learning at foundation phase. The Lesson Study approach grants teachers more appropriate ways of teaching Mathematics aimed at the acquisition of basic concepts through the spiral cycles of collaborative planning, acting and reflecting. A total of 88 participants (15 grade three learners, a mathematics teacher, and 72 teacher participants) were involved this study. A qualitative research approach was used via video recording of the Lesson Study Open Class session. The analysis was divided into two parts, namely the results from the lesson presentation and lecturers' reflections on the audience's observations of the Open Class session. Key findings for the study revealed the following: an enhanced level of learners' participation, intrinsic motivation and perceived teacher anxiety; the teacher participants suggested that the two models of division as used by the teacher during the Open Class session to be applied in actual classroom situations. Furthermore, they suggested additional resources as a means of making the lesson more stimulating. We are of the view that South African teachers could possibly be convinced to apply the Lesson Study approach so that teachers could benefit from one another's pedagogical content knowledge.

Keywords: *Division, Lesson Study approach, Open Class session, teaching.*

Introduction/Problem

In South Africa, Mathematics in the Foundation Phase covers five content areas. Each content area contributes towards the acquisition of the specific skills. In Grade 1-3, Number, Operations and Relationships are the main focus of Mathematics. Each teacher is quite rigorously based on the Mathematics, Curriculum Assessment Policy Statement (CAPS) document (DBE, 2003). Teachers use the CAPS document for preparing the lesson, class organisation and as resource for learner's work. However, the Department of Basic Education is still concern with the outcome of Mathematics in the Foundation Phase. In what follows, many classic questions in this field are still debatable issues: How can educators better teach Mathematics in the Foundation Phase of South Africa? What are the relevant practices in other countries, including the literature related to Mathematics teaching in the Foundation Phase?

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In the United States, education authorities tend to think that improving education is about improving teachers, recruiting better ones, firing bad ones. The Japanese on the other hand think about improving teaching (Haithcock, 2010). Hiebert and Morris (2012) argue to improve education in the United States, thinking needs to be shifted from how to improve teachers to thinking that is directed towards improving teaching. The Lesson Study is one way to do that, he contends. This approach has recently sparked interest in South Africa. Thus, inviting a Thai expert in the Lesson Study approach, to present a practical workshop on the Open Class technique at the Central University of Technology, was most crucial to the teaching of division.

In this paper, we reflect on a practical demonstration of a Lesson Study Open Class session (Lesson on division) held at the Central University of Technology (CUT), South Africa. This session was preceded by an overview on the Lesson Study Approach, by the workshop facilitator, Prof Dr. Maitree Inprasitha. Rules for observing the Open Class session were outlined by the facilitator. For the Open Class demonstration, he articulated the following aspects, to be observed by workshop participants, namely: *collaborative problem solving; learner ideas emerging from the lesson presented by the teacher and allowing time for learners' ideas to come out.* In the final session of the workshop, the facilitator further requested participants to reflect and discuss their observations on the Open Class session. The focus of this paper however captures the hosts' reflections on the Open Class session (the lesson presented on division to grade 3 learners/students).

Purpose of the study and Research Question

This paper sought to explore the teaching of division administered to grade three learners during a Lesson Study Open Class session held at the Central University of Technology, South Africa. It is envisaged that this investigation contributes to an understanding of how an open approach Lesson Study may develop teachers' Pedagogic Content Knowledge in the teaching of division, administered to grade three learners. Therefore, the research question that is probed is: "*What is the effect of using a Lesson Study Open Class Session in teaching division to Grade three Foundation phase learners?"*

Literature Review

In South Africa, the Foundation Phase consists of Grade 1, 2 and 3 classes. The five areas covered for Mathematics in this phase are as follow: Patterns, Functions and Algebra; Space and Shape (Geometry), Measurement and Data Handling. Each content area contributes towards the acquisition of the specific skills (DBE, 2003). In Grades 1-3, Number, Operations and Relationships are the main focus of Mathematics. The main progression in Numbers, Operations and Relationships happens in three ways, namely: the number range increases; different kinds of numbers and the calculation strategies (DBE, 2003). As the number range for doing calculations increases up to Grade 3, learners (school students) should develop more efficient strategies when doing calculations. Learners can do calculations by grouping and sharing- here for example, they can divide numbers and use appropriate symbols. From the latter discussion it shows that Mathematics teachers need to be

well prepared and need to understand how to teach the specific content area confined to division in Foundation Phase Mathematics.

Research to the teaching of division alludes to two models of division when either number of portions or the number of items in each portion is known (Fischbein, Deri, Nello, and Marino (1985). These are generally known as division through partitioning (sharing out), partitive division; division by chunking (grouping) and quotitive division (for instance, where 3 learners should share 9 sweets). In the partitive model, that might be asked is, "*How many sweets each of them will receive?"* In the quotitive model, the question that might be asked is, *" How many learners will receive 3 sweets if there are 9 sweets in total?"* The result of the calculation is 3 in each situation. In the first situation, the answer might not be 3, but 3 sweets per learner. In the second situation, there are 3 learners. Knowing whether the answer is 3 sweets or 3 learners is important, especially when it comes to dividing fractions. These models are also prescribed in the Foundation Phase Curriculum of South Africa, as division is taught by grouping and sharing, incorporating or discarding remainders (DBE 2003:25). In the division by incorporating the remainder, the remainder is in turn shared among the people doing the sharing (DBE, 2003:25). Therefor it becomes crucial that teachers have a thorough understanding of Pedagogical Content Knowledge (PCK).

In their research Ball, Thames, and Phelps (2008) identified three domains of PCK used in teaching elementary Mathematics, namely: knowledge of content and students (KCS), knowledge of content and teaching (KCT), and knowledge of content and curriculum (KCC). KCS is a domain where the knowledge of students and of Mathematics is combined in, for example, anticipating student strategies (Ball, Thames & Phelps, 2008). KCT on the other hand, is as a domain of knowledge combining teaching and Mathematics, for example, sequencing content. Strong PCK supports good planning, observation, and discussion around the teaching and learning of mathematics (Yoshida and Jackson, 2011). If teachers, are were of the manner in which a question about division could be posed, they can also learn students to do likewise. This could be achieved in the teaching and learning of Mathematics, via the use of a Lesson Study approach.

The name for Lesson Study in the Japanese context, is jugyokenkyu. *"Jugyo"* means teaching and learning whilst "*Kenkyu"* means study or research (Haithcock, 2010:2). Lesson Study is an ongoing professional development process utilised within Professional Learning Communities (PLCs) to allow teachers the opportunity to create a model for high quality instructional practices. According to Haithcock (2010:2), Lesson Study is a method for improving a lesson through teacher collaboration. Imprasitha (2012) defines an open approach to Lesson Study as techniques whereby students' mathematical thinking, perspectives, and development of teaching methods are integrated. He confirms that the method encourages independent mindset, increases students' participation and engagement in the classroom and further inspires them to think beyond and do away with the routine when solving mathematical problems. According to Inprasitha (2012) Lesson Study provides an opportunity for teachers to benefit from one another's pedagogical knowledge. With the learning goal in mind, teachers propose instructional activities that make learners thinking visible, open to observation and analysis," he concluded. This approach is feasible in the teaching of division to grade three learners as well.

Design/Procedure

This study adopted a qualitative research approach. A total of 88 participants were involved in this study (15 grade three learners, a grade 3 mathematics teacher and 72 educator participants). Video recordings were used to document authentic data of the Lesson Study and Open Class session (Fraenkel *et al*, 2012; Walsh 2001). Informed consent was obtained from the teachers and the principals of the schools involved in the lesson study (de Vos, Strydom, Fouché & Delport, 2002). Participants were informed of anonymity and confidentiality, applied to the research process (de Vos *et al.*, 2002). Authorisation to conduct this research in the Motheo district and to hold an Open Class session at the Central University of Technology was obtained by education authorities (Mouton, 2012).

In terms of the grade 3 learners, they attend a double medium school (English and Afrikaans) in a historically disadvantage area. This school has 1238 learners and 37 teachers. The parents of the English medium class seem to more involved in the children learning than the parents of the grade 3 Afrikaans medium classes. Furthermore, the learners from the English medium class appear to fair better in continuous assessment related tasks. Fewer barriers to learning are also experienced by the English medium class learners

Findings/Analysis

During the qualitative analysis the video recordings were transcribed by the first author then return to the second author to check the accuracy to ensure that transcripts were reliable (Creswell, 2012). The themes were developed by identifying the relationship among the codes in a cluster (Henning, Van Rensburg & Smit, 2007; Rapley, 2011). Three themes (Knowledge of Content and Students (KCS), Knowledge of Content and Teaching (KCT), and Knowledge of Content and Curriculum (KCC) became evident in pursuing the research question, *What is the effect of using a Lesson Study Open Class Session in teaching division to Grade three Foundation phase learners?* These themes are enumerated by An, Kulm, and Wu (2004) as the three components of Pedagogical Content Knowledge (PCK).

Theme 1: Knowledge of Content and Students (KCS)

The KCS link the recognition of knowledge acquired by students, teachers' awareness of students' conceptualizations, any prior knowledge acquired to face a task successfully and knowledge of the students' difficulties and mistakes about the goal of pre-empting the repetition of these difficulties and mistakes (Olfos, Goldrine & Estrella, 2014:918).

- ***Equal grouping and sharing***

Fischbein, et al (1985) articulate two models of division, namely, partitive division (sharing out) and quotitive division (grouping). These models of division (equal grouping and sharing) are prescribed for the Foundation Phase Curriculum in South Africa (DBE, 2003). This was also echoed by a teacher in the study.

Grade 3 Open Session Teacher: *"okay so the grade 3 gona learn about something called division… 4 times."*
Grade 3 Open Session Teacher: *"Even though they are in different groups you get the same answer. Okey now division is all about making groups and sharing out. There is a difference between dividing and dividing equally. I have a problem, 3 of my friends came to visit, so my mom came and she brought 2 packets of sweets and she said: "here is the 12 sweets, now you must share it so that your friends get equal amounts of sweets."*
Observations at table A: "*Divided the sweet by giving each member 1, 1, 1, 1 until everyone had equal amounts of sweets".*
Observations at table B: *"Divided 12 sweets among the 4 students, two and one to each member of the group."*
Observations at table C: *"Divided the sweets in giving 3 sweets to each members of the group".*
Grade 3 Open Session Teacher: "*How many learners did get 3 sweet?"*
Grade 3 Open Session Teacher: *"This is sharing. You divided 12 sweets among 4 students so that they all get the same number of sweets (Table A and B). This is grouping. You divided 12 sweets in giving 3 sweets to each students so that they all get the same number of sweets (Table C) (4 people get 3 sweet)."*
Teacher Participant 6: *"When asked about the division sign the children showed the multiplication sign."*

The Grade Open Session Teacher directed questions to learners/students and then later provided learners with her feedback based on their answers. The equal grouping and sharing approaches used for teaching division in the South African context is appropriate, but accommodation should be made to phrase the problem question in different ways.

- ***Grouping or sharing, incorporating or discarding remainder***

Furthermore, in South Africa, the Foundation Phase Curriculum prescribed a division by grouping and sharing, incorporating or discarding remainders (DBE 2003). This is exemplified in the excerpt below:

Grade 3 Open Session Teacher: "*Now you had 12 sweets and I took two away how much do you have?*
Grade 3 Learner: *"10"*
Grade 3 Open Session Teacher: *"Now I want you to divide it the same way that you did now. How many sweets each of you will receive?"*
Observations at table C: *"we can get 2 sweets each. Divide the other 2 sweets left by 4 to get ½. each student got 2½ sweets. 10 ÷ 4 = 2½"*
Grade 3 Open Session Teacher: "How many learners will receive 2 sweets if there are 10 sweets in total? What is the remainder?"
Observations at table C: *"4 learners will get 2 sweets each and the group is left with 2 sweets. 10 ÷ 4 = 2, remainder 2."*
Grade 3 Open Session Teacher: *"I said they can also give 1 or 2 sweets away (Joke)." Group A and C discarded the remainder. And Group B incorporated the remainder." You have solved division by grouping, sharing, discarding or incorporation the remainder."*
Workshop Facilitator: "When changing the 12 sweets to 10 sweets when the children answered with 2,5: "The Teacher could have changed the number of students grouping from groups of 4 to groups of 6/2. "
Teacher participants 6*: "They understood the work, each got to the answer using different methods. "*

The Grade 3 Open Session Teacher demonstrated how the task on division can be solved by either grouping or sharing, incorporating or discarding the remainder. The learners were mostly focussed on using grouping or sharing, incorporating the remainder. The teacher could have explored changing the composition of the groups (size and gender).

Theme 2: The Knowledge of Content and Teaching (KCT)

Teaching knowledge includes the teacher's knowledge about the task organization: teaching sequences, scene design for learning, identification of the content of that level's curriculum, use of context, examples, and analogies linked to said knowledge (Olfos, Goldrine & Estrella, 2014:918). This led to teachers identifying and selecting more appropriate tasks as demonstrated in the excerpt below:

Grade 3 Open Session Teacher: *"I have a problem, 3 of my friends came to visit, so my mam came and she brought 2 packets of sweets and she said here is the 12 sweets, now you must share it so that your friends get equal amounts of sweets."*
Grade 3 Open Session Teacher: *"... I want to know how have you divided the sweets in each group? How did your work it out?"*
Observations at table B: *"Divided 12 sweets among the 4 students, two and one to each member of the group."*
Observations at table C *"Divided the sweets in giving 3 sweets to each members of the group".*
Grade 3 Open Session Teacher: *"Now you had 12 sweets and I took two away how much do you have?"*
Teacher participants 7: *"Top learners in one group, average in one group the kids where excited and what Prof is doing in the Lesson study will work in our schools."*
Teacher participants 1*: "It was really, really nice to use division by grouping and sharing incorporating or discarding remainders."*
Teacher participants 2*: "It is nice to see someone demonstrate how to teach division to our children using the two models."*
The Grade 3 Open Session Teacher displayed adequate knowledge of teaching sequence, task organisation and curriculum content The design and posing of the questions were limited to eliciting only closed ended responses (Yes/No) from learners/students. Some other analogies linked to said knowledge could possibly been the Grade 3 Open Session Teacher.

Theme 3: Knowledge of Content and Curriculum (KCC)

Ball et al. (2008) define knowledge of the curriculum as being knowledge of the full range of programmes that have been designed for the teaching of particular subjects and topics at a given level, as well as of the various materials that are available in relation to these programmes. During the Open Class session, the workshop delegates commented on the division numbers. The following excerpt refers to the knowledge of content and curriculum:

Grade 3 Open Session Teacher:" *…she said here is the 12 sweets, now you must share it so that your friends get equal amounts of sweets."*
Grade 3 Open Session Teacher: *"How many learners will receive 2 sweets if there are 10 sweets in total? What is the remainder?"*
Grade 3 Open Session Teacher *"I said they can also give 1 or 2 sweets away (Joke)." Group A and C discarded the remainder. And Group B incorporated the remainder." You have solved division by grouping or sharing, discarding or incorporation the remainder."*
Grade 3 Open Session Teacher: *"there were 12 bones and 4 dogs. You can work with actual real life things not only with paper.*
Teacher participants3: *"They can come and demonstrate the curriculum as well."*
Teacher participants 1: *"To make the lesson more exciting, if you don't have stuff in the classrooms, bring it from home, so that they can work like that in group.*
Teacher participants 4*: "A lack of basic resources such as stationery, work cards and games Can pose challenges to the teachers and impacted negatively on the learners. During the reflection the teacher expressed it. "*

The Grade 3 Open Session Teacher appears to be well versed with the CAPS content knowledge. She also showed her mastering of the different models used for division (grouping or sharing).

The video-recorded observations of the Lesson Study showed that an open approach Lesson Study may develop teachers' Pedagogic Content Knowledge in teaching of division administered to grade three learners. Elements of three domains of PCK used in teaching elementary Mathematics were identified (Ball et al., 2008:403). From the above discussion, participants expressed the strengths of the Lesson Study process. Through group discussions and observing other teachers teach, they gained and enhanced both their Mathematics Content Knowledge as well as Pedagogical Content Knowledge. The teacher participants' concerns were about a lack of basic teaching resources and media; the type of questions asked to learners during class activities; and the grouping of learners.

Conclusion

The emphasis of this study was on the lecturers' reflections on an Opend Class session in the teaching of division for the foundation phase. Lesson study is a method that can be used to improve the quality of Mathematics instruction. In this Open Class session, we have an opportunity to find out whether the Lesson Study approach may develop teachers' Pedagogic Content Knowledge in the teaching of division to grade three learners. Our reflections indicated positive input in the Lesson Study discourse. Thus, the Lesson Study process provides a meaningful context and promote collaboration and sharing amongst Mathematics teachers.

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Academic Writing Skills of Doctoral Candidates at the Central University of Technology, Free state (CUT): The Bad, the Ugly and the Innovative

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Abstract
The South African higher education landscape faces many challenges, of which the enrolment, retention and completion rates of doctoral candidates are pronounced. To study at doctoral level entails acquiring a new set of skills. These include a questioning attitude; rigor; and the ability to read and write critically and analytically about academic arguments, and create new perspectives on matters. Doctoral candidates are required to produce substantial, independent, in-depth and publishable work that meets the expectations of academic readers in the target audience. This makes writing a doctoral thesis uniquely demanding, due to the direct evaluative role that examiners have as primary readers.

Doctoral thesis writing proves to be difficult, not only due to the high standards required for writing a thesis, but also as a result of students' insufficient mastery of grammar and vocabulary. Research about academic writing focuses mainly on linguistic problems faced by non-native speakers, with academic language and learning support strategies being offered as a means to overcome these obstacles. Literature indicates that more attention should be paid to the education and training of doctoral students.

The purpose of this paper is to highlight matters and challenges that are experienced in terms of academic writing, and to propose innovative strategies for promoting the academic writing skills of doctoral students. Perspectives were gained, through a qualitative inquiry, from doctoral candidates at the Central University of Technology, Free State (CUT) and their supervisors, and from language editors who regularly proof-read doctoral theses.

The results suggest that challenges experienced with academic writing at doctoral level can already be addressed at undergraduate level – thereby challenging education for future change. This paper proposes innovative strategies to improve academic writing. These include reflective practice, metacognition and transformative learning, which are regarded as highly relevant and helpful towards continuous professional development.

Key words: *Academic writing skills, doctoral candidates, Central University of Technology, Free State (CUT)*

1. INTRODUCTION

Writing is an essential skill that is employed in all occupational spheres of life. For some people, such as writers, bloggers and journalists, it comes naturally. For others, though, writing, especially academic writing, is a daunting task. Writing effectively is a prerequisite for students at under- and postgraduate level. In a large number of disciplines, it is often the only means by which students' content knowledge is assessed. Writing ultimately clarifies our thinking (Kearns 2017), and supports the learning process by letting students engage with the

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content at a deeper level (Dysthe in Johansen and Harding 2013:368), and enabling them to become members of a discourse community (Hirvela and Hyland in Mazgutova and Kormos 2015:3). Writing effectively at postgraduate level ultimately provides an indication of the extent to which students master the process of their research (Al-Zubaidi 2012:47).

Doctoral candidates, in particular, are faced with a considerable amount of writing, with the PhD dissertation being the longest project they will write in their careers. It takes skill and endurance. They are required to present their research results to a scientific community (Lategan 2017:4), whilst simultaneously meeting the expectations of academic readers in the target audience (Al-Zubaidi 2012:49). The South African Qualifications Authority (SAQA)'s level descriptor for a doctorate stipulates that doctoral candidates, when producing and communicating information, should demonstrate the ability to produce substantial, independent, in-depth and publishable work that meets international standards; is considered to be new or innovative by peers; and makes a significant contribution to the discipline, field, or practice, as well as the ability to develop a communication strategy to disseminate and defend research, strategic and policy initiatives, and the implementation thereof to specialist and non-specialist audiences, using the full resources of an academic and professional or occupational discourse (SAQA 2012:15 of 16).

Dissertation writing proves to be one of the most difficult forms of academic writing (Imani and Habil 2012:460; Trafford and Leshem 2008:118), and poses many challenges to candidates during their postgraduate journey. This study aims to explore problems and challenges experienced with academic writing at doctoral level, and to propose innovative strategies for promoting academic writing skills. The research methodology comprised a qualitative research design. Data was captured by means of semi-structured, face-to-face interviews with doctoral candidates at CUT, their supervisors, and various language editors who regularly proof-read doctoral theses.

2. LITERATURE REVIEW

Morton, Storch and Thompson (2015:1) concede that, over the years, there has been a growing recognition of the complexity of academic writing. Not only is academic writing regarded as writing by academic researchers for scholarly publications (Kaldord and Rochecouste in Johansen and Harding 2013:367), but also as "a particular style of expression that researchers use to define the intellectual boundaries of their disciplines and their areas of expertise" (USC Libraries 2016:1 of 5).

Academic writing is governed by rules and practices that adhere to traditional conventions (Wilkes, Godwin and Gurney 2015:166), and should ultimately present a clear, creative and professional image of a particular matter (Your Dictionary 2015:5 of 9), without jeopardising academic standards (Trafford and Leshem 2008:118). It involves solid planning, in which thoughts are critically and strategically organised. Academic writing is an activity that requires awareness of the disciplinary rhetoric, as well as the capacity to write grammatically accurate and coherent prose (Lourens 2007:1). Academic writing also follows a consistent stylistic approach, such as the Harvard Method of Referencing, MLA, APA or Chicago Manual of Style, and employs a specific "structural code" (Johansen and Harding 2013:368). In this regard, a doctoral thesis is structured in accordance with a set of macrostructural components, such as an abstract, introduction, literature review, research methodology, discussion of results, conclusion, and recommendations. This "structural code" requires that doctoral candidates demonstrate skills that are commonly associated with doctorateness, such as finding

appropriate evidence; conducting an extensive literature review; synthesising and contextualising information into an authoritative viewpoint; analytically and critically thinking, reflecting and debating over academic arguments; and illustrating clinical competence through academic writing. Academic writing also entails engaging in dialogue with a disciplinary community. Morton *et al.* (2015:2) consider academic writing as a social activity in which individuals are regarded as socially situated actors. Writing as a social practice is therefore embedded in a writer's interactions with texts and people, both of which are considered as essential resources in the process of learning to "write engagingly" (Green in University of Technology Sydney 2015:1 of 1) in discipline-specific ways.

Literature indicates that academic writing is difficult (Kamler and Thomson 2006:2 of 187), complex (Morton *et al.* 2015:1), time consuming (Kearns 2017), challenging (Hopwood 2015:1 of 4), demanding and frustrating (Gimenez in Johansen and Harding 2013:367), and elaborated and explicit (Hyland in Biber and Gray 2010:3), with grammatical and syntactical complexities (Al-Zubaidi 2012:49). The genre of academic writing is also discipline dependent (Kaufhold 2015:125), with the rules not being explicitly expressed (Elton 2010:151). Cultural differences, academic background, negative attitudes towards the requirements of academic writing, plagiarism, patch-writing, over-reliance on quotation (Al-Zubaidi 2012:48, 51), unsubstantiated claims (Lategan 2017:85), and failure to take an authoritative stance (McCulloch 2013:136) are other challenges.

Research about the academic writing of postgraduate students focuses mainly on linguistic challenges that international students encounter when writing their dissertations in English (Al-Zubaidi 2012:46; Fenton-Smith and Humphreys 2015:40; Imani and Habil 2012:460; Johansen and Harding 2013:366; Kaufhold 2015:125), with academic language and learning support strategies being offered as a means to overcome these obstacles (Al-Zubaidi 2012:51; Elton 2010:151; Fenton-Smith and Humphreys 2015:40; Imani and Habil 2012:460; Kaufhold 2015:133; Mazgutova and Kormos 2015:13). In this regard, credit- and non-credit-bearing academic literacy courses (Language Centre 2017:1 of 1), Academic Learning and Language (ALL) consultation services (CUT 2016:1 of 1), writing workshops or retreats (Fenton-Smith and Humphreys 2015:48), collaboration between language instructors and content specialists or supervisors (Kaufhold 2015:125), academic and social integration (Al-Zubaidi 2012:46), in-depth interviews to foster self-reflection (Morton *et al.* 2015:2), academic reading (Weideman 2007:111), and snack-writing strategies (Times Higher Education 2008:1 of 13) appear to be popular strategies employed by universities to assist doctoral candidates in writing their theses.

A study by Lategan (2017:5) about the enrolment, retention and completion rates of doctoral candidates pointed to the fact that many doctoral students cannot manage a publication as a condition for graduation; the defence of the study (viva); or presenting the research results to a broader research community. The success rate for PhDs in South Africa is only 50% (Ortega 2017). In other words, only 50% of candidates who enrol for the degree complete it. The Academy of Science of South Africa (ASSAf)'s report, "The PhD Study: An evidence-based study on how to meet the demands for high-level skills in an emerging economy" (2010), the South African Regional University Association (SARUA) Report on Doctoral Education (2012), the White Paper for Post-school Education and Training (Department of Higher Education and Training, 2013) and the National Development Plan (NPD): Vision 2013 (2011) further inform these challenges, and indicate that more attention should be paid to the education and training of doctoral students.

Lategan (2017: XV) indicates that "more attention should be given to creativity, innovation and entrepreneurship in the 'postgraduate curriculum' through scholarship". The aim of this study is to explore challenges and problems that doctoral candidates of CUT, their supervisors and language editors experience with academic writing, and to propose innovative strategies for promoting academic writing skills at doctoral level. This paper lends itself to the Vygotsky-based theory that learning is a process of social constructivism, shaped by the quality of dialogic engagements with peers and educators inside and outside the classroom. This type of interaction simulates peer teaching, and can also enhance learners' critical and reflective thinking skills, which are considered key objectives of academic writing.

3. RESEARCH DESIGN

The research employed a qualitative study in which semi-structured, face-to-face interviews were conducted with doctoral students at CUT, their supervisors, and language editors who regularly proof-read doctoral theses. The author opted for qualitative interviews as the method most likely to reveal the multiplicity and complexity of academic writing.

The questions centred around problems and challenges experienced with academic writing at doctoral level, whilst participants were also requested to propose strategies for promoting academic writing skills at doctoral level.

4. DATA ANALYSIS AND DISCUSSION OF RESULTS

The responses were captured and reviewed, whereafter a thematic approach was employed, grouping challenges and problems experienced with academic writing according to four themes commonly associated with errors in academic writing at doctoral level (Lategan (2017:85). These are: the mechanical nature (spelling and grammar); the scholarly nature (unsubstantiated claims); the microstructure level (flow of argument and inconsistencies); and the macrostructure level (quality and clarity of purpose).

4.1 The mechanical nature (spelling and grammar)

The supervisors all concurred that grammatical errors and spelling are major challenges. "Students cannot write!" said one. Other supervisors emphasised that grammar and syntax at doctoral level should be on standard. One of them mentioned that, when a student lacks proper grammar and syntax usage, she will send the document back to be language editor before she reads it again. "I repeat myself numerous times, but eventually the students start to understand and get it right."

Grammar and spelling are concerns also raised by language editors. One replied: "Doctoral students will write one thing in three different ways. There seems to be a lack of spell-checking on the side of the students. They leave prepositions and punctuation out".

4.2 The scholarly nature (unsubstantiated claims)

Comments made by supervisors and language editors revealed that unsubstantiated claims are a major concern. One of the supervisors said that students "are not reflecting on and engaging with the text". He added: "Students do recycling of already known information". Another supervisor uttered: "Students have the ability to collect sources, copy and paste, but cannot interact with the text, give their own views, and link it with their studies".

One of the language editors mentioned that students quote sources word for word, and the thesis is thus a replica of something already said by someone else. "I sometimes feel that candidates do not know what to say, so they keep on saying the same thing over and over again". She added that students write half sentences, and do not make use of proper referencing techniques. They make statements without naming the authors. Another language editor said: "There is a lack of doctorateness and authoritative stance, as well as the contribution being made towards a particular field". She explained: "The student's own voice is not coming through. It is basically a repetition of what other authors say".

4.3 The microstructure level (flow of argument and inconsistencies)

During the interviews, one doctoral candidate mentioned that the synthesising of information is "a bit challenging". Another candidate struggled with sequencing of information, systematic thinking, and linking of paragraphs. "With time and practice, it becomes better and easier."

According to supervisors and language editors, the flow of arguments is a major concern. The following comments were made by supervisors: "Paragraphs and sentences are not structured properly"; "students do not demonstrate narrative thinking"; and "ideas do not flow logically and systematically". A language editor remarked: "Some ideas stand loose, without linking sentences from one paragraph to the next".

The supervisors and language editors mentioned that errors relating to uniformity and inconsistency are very common when reading through doctoral theses. One supervisor said: "Students are not uniform in their writing. For instance, they do not write out an abbreviation in full the first time it is used, and thereafter only use the abbreviation". One language editor remarked that students use abbreviations without clarifying what it stands for, and omits it in the list of abbreviations. Another language editor referred to referencing, where candidates do not keep to the same style when quoting sources in the text. Some sources, according to her, are sometimes quoted without a comma after the source's surname; at other times, the comma appears after the surname. She also mentioned that candidates are not consistent with their tenses.

4.4 The macrostructure level (quality and clarity of purpose)

According to one of the supervisors, students need to meet the demands and expectations of the academic target audience. "Students must present their work in such a way that anyone reading it will be able to understand it. Especially at doctoral level, students need to write at the same level as their examiners, their peers." Another supervisor mentioned that doctoral candidates do not have an understanding of, and insight into, the topic under investigation. "The lack of insight is challenging their writing abilities." He added: "Students do not read examples or expose themselves to examples of good scholarly work". He said that students seem to have limited historical understanding of a particular matter. "They just start to read, without asking the question 'where is this coming from?'" Students also do not read the authoritative information on a particular matter. He always asks his doctoral students three questions in this regard: "Firstly: Who are the five leading authors in this particular field? Secondly: What are the five leading themes linked to your topic? Thirdly: What are the five leading journals reporting on this particular topic/issue?"

One of the language editors said that, as students are writing for a particular audience, they must ensure that their message is clear to that specific audience, without bias. She said that students do not summarise or conclude their thoughts at the end of their theses. "They must

state where and how they have addressed the primary and secondary research questions." She added: "Students also tend to lose focus of their research topic, and they often wander off. Doctoral candidates sometimes write too broad, and lose focus of the research topic".

The interviews with the doctoral candidates, supervisors and language editors provided valuable insight into exploring obstacles and problems experienced with academic writing at doctoral level. The findings underscore challenges raised in the literature review. These include: grammaticality (Kaufhold 2015:125), language-related problems (Fenton-Smith and Humphreys 2015:41), patch-writing (McCulloch 2013:136), unsubstantiated claims (Lategan 2017:85), over-reliance on quotation (McCulloch 2013:136), and not meeting the expectations of academic readers in the target language (Al-Zubaidi 2012:49).

5. INNOVATIVE STRATEGIES FOR PROMOTING THE ACADEMIC WRITING SKILLS OF DOCTORAL CANDIDATES AT CUT

Based on the perspectives from the literature and the findings from the study, the author proposes six innovative strategies to promote the academic writing skills of doctoral candidates at CUT. These are: mind maps; workshops; reading; reflective practice, metacognition and transformative learning; addressing academic writing at undergraduate level; and snack writing.

5.1 Mind maps

Drawing mind maps could be a valuable tool in enabling doctoral candidates to order their thoughts systematically, thereby addressing the challenges at microstructure level. Daniels, Hunter, McGhie, Middleton Horn, Van Jaarsveldt and Van Vuuren (2014:130) mention that mind maps are useful when planning what you are going to write about. During the qualitative interviews, one of the doctoral candidates mentioned that she employs a systematic way of writing, in which she first drafts a mind map, ordering her thoughts systematically. In this way, she learns to master the synthesising of information. "I then quote sources in support of a particular viewpoint. Thereafter, I draw my own conclusions, and argue about perspectives taken on issues."

5.2 Workshops

Comments made by participants in the CUT study correlate well with previous research, indicating that workshops on academic writing and doctorateness greatly contribute to addressing the academic writing errors of a mechanical and scholarly nature, and those at micro- and macrostructure level. During the empirical investigation, all doctoral candidates indicated that they had attended workshops relating to doctorateness. One candidate proposed that workshops be presented to doctoral candidates every six months, rather than as a cluster at one specific time. He said that this could help doctoral candidates as they mature and proceed with their doctoral journey. One language editor and one supervisor recommended that students attend workshops on academic writing and doctorateness. "They should be taught a list of joining words to use in their academic writing, and words to use when quoting sources, as some students use the same words over and over again. Academic writing and doctorateness go hand in hand", the language editor said.

5.3 Reading

Participants in the CUT study recommended that doctoral candidates read more in order to become better academic writers. In this study, one doctoral candidate emphasised the importance of reading and reflective practice. She mentioned that she had read much

throughout her primary and secondary education. "This, in particular, I think, contributed to my 'linguistic intelligence'". Another candidate added: "Students should read more, since reading improves writing". The supervisors all agreed that students should read more, in order to develop their academic writing skills. Some comments include: "Students need to dig in deep in their field of specialisation, and read numerous articles about their focus area"; "there must be a strong will to read"; and "students should be encouraged to read more academic articles". One of the language editors added that doctoral candidates must do their own research (reading) about academic writing.

5.4 Reflective practice, metacognition and transformative learning

The findings of the study underscore the importance of reflective practice, metacognition and transformative learning, which are regarded as highly relevant and helpful towards continuous professional development (Instructional Design.org 2015:1 of 3; Livingston 1997:1 of 4; Skills you need 2017:2 of 4). These strategies will enable doctoral students to experience their academic writing, think about it, and learn from their experiences, in order to improve their academic writing skills.

The ability to reflect on one's own experience and knowledge, and use that to make improvements, is an important aspect of university-level thinking (Solent Online Learning 2017:1 of 17). According to two supervisors, doctoral students need to read through their own work, edit it, recognise their own mistakes, and critique their own work. One of the doctoral candidates mentioned that she learned best from correcting her own mistakes. "Doctoral candidates should write and retry over and over again, until they get it right."

5.5 Addressing academic writing at undergraduate level

The biggest concern raised by doctoral candidates, supervisors and language editors is the lack of practical writing methods and language practice at undergraduate level. They indicated that CUT should revisit the undergraduate curriculum to promote academic writing at postgraduate level. One supervisor mentioned that a bigger focus on academic writing needs to be employed at undergraduate level. The following comments were made by doctoral candidates: "Students need to be trained at undergraduate level on how to write in an academic manner", and "I suggest a six-month module on academic writing for all undergraduate students". "Another way of improving academic writing at postgraduate level is to incorporate assignments at undergraduate level that must adhere to the standards and requirements (writing style) of an academic essay", added a language editor.

With regard to language practice, one doctoral candidate remarked: "A lot more language practice should be built into the undergraduate curricula". In this regard, a student, supervisor and language editor recommended that a mark or small percentage be allocated to grammar and syntax, regardless of whether a student studies towards a Language Practice qualification. The language editor mentioned: "Some lecturers, especially when assessing students' knowledge at an undergraduate level, oversee language and grammatical errors, more even so when knowledge is tested in a field other than Languages; for instance Somatology or Engineering". She said that, by allocating a mark for language, students will learn to write with care from undergraduate level.

5.6 Snack writing

Although snack writing was not mentioned by supervisors, doctoral candidates and language editors as a strategy to improve academic writing, the author regards it as a valuable tool to get

students committed to writing and improve their academic writing skills. Kearns (2017) proposes that students who engage with thesis writing set aside time every day for writing their research. He refers to this time as the "two golden hours", and encourages them to write early in the day, at a dedicated place. The door should be closed, and other distractions, such as cellphones or internet connections, should be eliminated.

6. CONCLUSION AND RECOMMENDATIONS

In this study, the author highlighted problems and challenges experienced with doctoral thesis writing, and proposed innovative strategies for promoting the academic writing skills of doctoral candidates at CUT. The development of the strategies was informed by the complex and tacit nature of academic writing, particularly at doctoral level, drawing from the literature review and recommendations made by doctoral candidates, supervisors and language editors.

Perhaps the greatest contribution towards promoting the academic writing skills of doctoral candidates at CUT is the recommendations made by doctoral students, supervisors and language editors that doctoral writing should be informed and developed at undergraduate level. The findings from this study reveal that practical writing methods and language practice should be incorporated into the curricula of undergraduate programmes at CUT.

It is hoped that these methods are eventually incorporated into the undergraduate and postgraduate curricula at CUT, thereby challenging doctoral education for future change.

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Experienced Difficulties of BSE- Chemistry Students in Physical Chemistry and Suggested Enhancement

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Abstract
This study aimed to determine the experienced difficulties in Chemistry 70: Introduction to Physical Chemistry among selected BSE-Chemistry students during the school years 2014 to 2016. Respondents were 10 BSE-Chemistry students who had undergone Chemistry 70 during the 1st semester and two (2) professors of Physical Chemistry at the Chemistry Department, College of Science and Mathematics, Mindanao State University – Iligan Institute of Technology, Iligan City. It was found that out of the total 10 BSE-Chemistry respondents, majority got a passing grade of 1.50 to 3.00 in Chemistry 70, representing their academic performance for this particular study. They considered 'Chemical Thermodynamics and Equilibrium' as "much difficult" and classified 'teacher factor' as the primary reason for the difficulty in understanding the subject. Teachers play a great role in the learning of the students in Physical Chemistry. They must be equipped effectively with the concepts needed for the efficient delivery of lessons in the classroom. Moreover, teachers must be able to relate both theories and concepts to real-life situations for the students to have a better understanding of the subject matter. It was suggested that students should be able to master the basic skills and concepts in Math 61 to improve their mathematical skills which are very much needed in the study of Physical Chemistry.

Keywords: *Physical Chemistry*

Introduction

The wide expanse of the universe poses great challenge for humanity. A human being strives to exist with the environment, thus, every individual needs to find ways to survive and co-exist with the environment.

In order to endure life, each one has to learn more, hence the need to pursue education, that is, to acquire knowledge, skills, values, beliefs, and habits. Education takes place with the guidance of educators, but learners may educate themselves not only in the four corners of the classroom but also from the environment where they live.

Each learner may be able to perceive things and evaluate them as good or bad as he or she enters school seeking to acquire knowledge to continually grow and prosper. It is the teacher in school who facilitates the learning process using different techniques and strategies to ensure holistic development of the learner (Logan, 2015).

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In the Philippines, the curricular offerings demand so much effort from each learner if he or she really needs to succeed in the academe. One of the curricular offerings of the Mindanao State University – Iligan Institute of Technology in Iligan City is the Bachelor of Secondary Education Major in Chemistry or BSE-Chemistry offered by the Department of Science and Mathematics Education (DSME) which admits enrollees with SASE score of not less than ninety (90).

This four (4) year education program is among the difficult courses not only in College of Education (CED) but in the whole institute due to the fact that Chemistry is a highly specialized subject and loaded with other courses from other fields of natural sciences like Physics and Mathematics. Hence, a number of BSE-Chemistry students shift to other programs after finding so much difficulty in the program. This made BSE-Chemistry fall short in number in terms of producing graduates every year.

In this degree course, one of the most challenging subjects is Physical Chemistry which students generally consider as a difficult course because it deals with specific mathematical calculations together with concepts which is needed to be fully understood, otherwise they would not learn anything at all.

Thus, the subject was deleted from the curriculum in the past years, but later restored in 2010 because of the recommendation coming from the Commission on Higher Education (CHED) – a development regarded as „a return to the old curriculum.“ Subsequently, because many students found Physical Chemistry difficult, many would flunk and/or retake the subject several times causing them to be delayed in graduating.

Notwithstanding the complaints of students, Physical Chemistry remains an essential course, specifically for those who want to pursue their masters degree and to those who wish to be future Chemistry teacher.

As a branch of Chemistry, Physical Chemistry demands not only knowledge of theories but more importantly, on having practical skills especially in solving problems in Mathematics. Many students find the subject challenging because it does not only require the ability to identify given facts but also necessitates comprehension and analysis of the problem's solution.

However, this requires a thorough background and strong foundation of basic chemistry and mathematics courses to support a more intellectual and broader scope and more advanced study of physical chemistry. It was on this premise that this research undertaking was conceptualized and developed to determine the difficulties of BSE-Chemistry students in the subject Physical Chemistry. In the learning process, it is important to determine the students“ difficulties and learning styles for the teachers to help them look for specific strategies to handle such challenges, to decrease the number of failing grades in this particular subject, and increase the number of BSE-Chemistry graduates in the Department of Science and Mathematics Education, College of Education, Mindanao State University – Iligan Institute of Technology, Iligan City.

Statement of The Problem

This study aimed to determine the experienced difficulties in Chemistry 70: Introduction to Physical Chemistry of the BSE-Chemistry students during the school years 2014-2016.

Specifically, it sought to answer the following questions:

1. What is the academic performance of the BSE-Chemistry students in Chemistry 70: Introduction to Physical Chemistry?
2. What topics in Chemistry 70 are experienced as great difficulties by the BSE-Chemistry students?

3. Is there a sufficient evidence to conclude that the students find difficulties in the covered topics in Chemistry 70?
4. What are the possible reasons or causes for such difficulties?
5. Is there a significant relationship between the possible reasons or causes and their academic performance in Chemistry 70: Introduction to Physical Chemistry, course?
6. What are the suggested enhancements to address such difficulties in Chemistry 70?

Literature Review

Chemistry as a Subject

Chemistry has always been classified as a hard, rigorous science course; a course rich in context, studying the never-ending realm of possibility and discovery in which over ten million man-made chemicals have already been discovered and millions more are waiting to be analyzed by future scientists (Davis, Metcalfe, Williams, & Castka, 2002). It is considered a cornerstone of scientific knowledge and medical advancement.

The subject Chemistry has historically begun in high school as part of a rigorous series of college preparatory courses beginning with biology. One study found that schools offering in-depth courses in biology, chemistry, and physics better prepared students for college than schools offering a breadth of knowledge in various scientific areas as many times required by standard tests (Bartol, C. R., & Bartol, A. M. (2012)).

Teaching Chemistry

Regarding delivery of lessons in the subject Chemistry, several researchers, teachers, and science educators cited Chemistry as a difficult subject for students (Turanyi and Toth, 2013) due to many factors: lack of concept understanding and internalization on the part of the learners, teaching styles applied during class, teaching aids scarcity and the language of chemistry as a general difficulty. All these factors made students to have poor understanding, even lack of understanding in the last three (3) decades, as such misconceptions in chemistry attracted attention on the part of both learners and educators (Ayas and Demirbas, 1997).

Physical Chemistry as a Branch of Chemistry

Solving numerical problems and understanding the concepts on Physical Chemistry was the main reason why the students experienced such difficulty. Study says that the students must have to be exposed to various choices in solving problems and even in understanding the concept itself. The most difficult subject encountered by students has become the biggest struggle to the lecturers. This observation was supported by Nicoll, Francisco, and Nakhleh (2001) who cited that from the students‟ and lecturers‟ points of view, Physical Chemistry was definitely a struggle which was proven by the learners‟ actual performance in this subject rated as relatively low.

Chemical Thermodynamics in Physical Chemistry

Regarding advance concepts of thermodynamics and kinetics in Physical Chemistry, many students perceived the subject as one of the most difficult topics ever tackled in the classroom (Sozbiler et. al, 2010).

Similarly situated, Sozbiler et al (2010) cited some fundamental chemistry concepts as not fully grasped by students in their early years of schooling and many also held scientific incorrect concepts resulting to students troubled with advanced concepts not fully understood specifically those which were supposed to be fundamental to chemistry (Holme, 2015).

Such fundamental thermodynamic concepts in chemistry had created difficult experiences among many high school students as they were also found to be difficult among university students (Sozbiler, 2010). As foundation of chemistry, thermodynamics is really important, but most students took the course with very limited concepts about the subject matter hence the high level of difficulty on the subject matter (Adams, 2008).

In the university level courses, especially chemistry majors (pure science and education courses) and even in engineering, thermodynamics is one of the fundamental topics in chemistry and physics subjects. In terms of the development of industry and standards of human life, it is significant to verify the students‟ understanding in physical chemistry and problems in grasping and applying such principles to actual situations.

Mathematical Aspect in Physical Chemistry

According to Savage & Hawkes (2000), mathematical problem is very familiar, especially when one works in the field of mathematics, physics, and engineering.

According to Mar and Grove (2010), the students experienced difficulties from the moment they enter university. Development of mathematics support centers and wide area of learning materials were considered as a problem community-wide and as an institution (Savage and Grave, 2014). In a semi-structured interview by a third year chemistry student with the educator, it was found out that mathematics in Organic and Inorganic Chemistry subjects were considered as the issue in Physical Chemistry. According to their results, mathematics functions in all branches of chemistry to support practical works.

The course structure identified certain issues not allowing students sufficient opportunities to develop their mathematical abilities through the application, and the reliance upon summative examinations as a means of assessing mathematical skills. Sufficient additional support from the staff must be there, but the students themselves must have to do more (Gagan, 2008).

Teaching-Learning Process

The struggle of a student is wide and has varied range of interesting reasons, by which presentations or reactions vary in different levels. Every student has issues in more than one area and the relationship between these issues was usually complex and interdependent. Thus, the need to have an individualized and holistic approach to help students in such difficulty, where students‟ struggles are presented in many ways: it could be obvious and less obvious; still these are the most common: 1) failing a written or practical exam; 2) poor attendance; and 3) poor preparation for the sessions. “Separateness” from a group or their reluctance to join in the lesson or discussion could be the worst to happen. The student may look anxious and depressed and maybe some of them will accompany other students and share concerns on such learning difficulties (Cantillon, 2010)

Related Studies

Students' Performance in Physical Chemistry

A study conducted by Shadreck (2013), suggests that the students agree with the statement that foreseeing physical chemistry as difficult subject affecting academic performance. This will lead to the development of anxiety and phobia and hence a lower student success rate. According to Stanford et al (2016) about chemo phobia inside the classroom, students may treat physical chemistry as a problematic science leading into a poor performance. On the other hand, lecturers also found out that having a hard time in physical chemistry was caused by lack of confidence, under preparedness, student attitudes and beliefs.

Lecturers on the other hand also agree that knowledge of general chemistry would help improve students‟ understanding in physical chemistry. As it influences how the students may attain new ideas. It is vital for the lecturers how they are going to input the knowledge needed in their current framework of understanding. It is important for lecturers to elicit students‟ prior knowledge and monitor inconsistencies that may arise as learners try to incorporate new knowledge within their current framework of understanding. Both students and lecturers agree that laboratory sessions and tutorials greatly improve performance in Physical Chemistry (Shadreck, 2013).

On the other hand, students also agree that by doing group discussions can help them also in understanding the subject and improve their performance. The same sentiments also share with the lecturers. This finding is in agreement with Prince (2014) study, which shows that classroom discussions significantly improve students‟ retention rates. Lecture method and multiple teaching methods are being encouraged in chemistry classrooms. In students‟ understanding involvement, group discussions and cooperative learning methods are becoming popular.

Students' Difficulty in Chemical Thermodynamics

It is noted by the lecturers that physical chemistry involves a lot of concepts in physics, that students should really have background in physics and mathematics (especially in calculus). Hence to succeed in physical chemistry, differential and integral calculus is needed. Performance in mathematics may have a positive influence on the performance in physical chemistry. It is also parallel on the study conducted by Grove & Pugh‟s (2015) which indicated that good grades in mathematics and physics is a great factor in succeeding physical chemistry and advocate for the mathematical preparation of physical chemistry students.

Many do not succeed in chemistry because students struggle especially from secondary schools to universities in many countries (Guerrero, 2016). Based on the study of Sozbiler et. al (2010), it is shown that many students had a misconception on the basic concepts of chemistry but remain unchanged even when they enter to university.

In Ethiopia, it was found out that a misconception occur both by teachers and students on the basic chemical concepts and reactions within primary and secondary schools (Lemma, 2013).

Other various reasons were considered as possible sources of the learning difficulties (Woldamanuel, 2014). These can be grouped into the following recurring themes: (a) lack of knowledge of fundamental thermodynamic concepts, (b) application of algorithms without conceptual understanding, (c) using thermodynamic data to explain situations involving kinetics, (d) memorization of scientific laws and statements without understanding, resulting

in inappropriate overgeneralization, (e) confusion of fundamental ideas, (f) defining fundamental ideas according to their usage in everyday language, (g) the effects of everyday experiences, and (h) socio-economic and methodological aspects of the teaching and learning environment.

Implications on Teaching

Both lecturers and students agreed that the use of active learning methods like short exercises during lectures improve student understanding and performance in the subject (Shadreck, 2013). The study discusses the usefulness of the short multiple choice questions and reports to improve the performance and make the student become responsible to their success. On the other hand, Kovac (1999) describes four strategies for implementing active learning in chemistry: (1) involves computer-based learning exercise during lecture, (2 supplementing cooperative learning by occasional mini-lectures, (3) uses concept tests, and (4) problem sets. These may lead to better learning and may help the students develop a more positive attitude towards the subject. It was revealed that these active learning strategies were infrequently used and insufficient time and resources was cited by the lecturers in using these techniques.

Lecturers and students agreed that the use of lecture outlines, concept maps and diagrams help in improving student performance in the subject (Shadreck, 2013). The study revealed using lecture outline, summary sheet, line diagrams, and concept maps resulted to the improvement in chemical education. For complicated theories, concept mapping is the appropriate tool in organizing concepts like Physical Chemistry which contains many equations and theories.

Even after the learning process, the students usually are not exactly aware of what they have learned and are unsure of the relationships between the theories.

The study of Sozbilir, Pinarbasi, and Canpolat (2009) reported that students fail to differentiate between the rate of reaction (kinetics) and the extent of the reaction (equilibrium/ thermodynamics) with conceptions on prospective teachers suggesting that they did not adequately understand the difference between kinetics and thermodynamics and were confused on these two domains which were, in fact, two totally different aspects of phenomena: solubility, the equilibrium constant and free energy change were all thermodynamic quantities.

Another possible cause of misconceptions could be the students‟ understanding of basic science concepts which sometimes overestimated and their difficulties in achieving an understanding of basic scientific concepts are, at times, underestimated by science lecturers. If the lectures are more aware of the source of the misconception of the students and their limited value of study on the scientific concepts, teaching of science concepts would be more reasonable. (Sozbilir, 2004).

Instructional Strategies Used

Findings about methods of instruction are presented in the table below indicating that lecture method using transparencies and an overhead projector (OHP) and oral explanations of notes of handouts had been the most frequently used methods (Shadreck, 2013) while lecture method using chalk and board and experimentation was occasionally used; dictation of notes and group work were rarely used while PowerPoint presentations, CD‟s and models were never used. It is also revealed that some of the lecturers prefer to use OHP in presenting their lesson. Moreover, interview with students showed that they preferred demonstration methods as well as experimentation which enabled them in linking

theory to practice.

	Teaching Method	Percentage Response	Ranking
1	Lecture method using chalk and board.	50%	3
2	Lecture method using transparencies and OHP.	90%	1
3	Oral explanation of notes on handouts.	85%	2
4	Dictation of notes.	20%	5
5	Lecture method using power point slides and CDs.	0%	7
6	Demonstration method using models.	0%	7
7	Experimentation.	45%	4
8	Group work – problem solving.	10%	6
9	Lecture demonstration – student demonstration.	0%	7

However, due to lack of equipment, apparatus, and chemicals, these preferred methods were not used, as they were expensive under such harsh economic environment thus Subair (2001) advocated the use of different instructional approaches in order to motivate and promote learning hence meeting the learners‟ educational needs.

Research Design

The researchers used the Qualitative Survey (in-depth interview) and Purposive-Sampling method of research. The data were obtained through a One-on-One in-depth interview with ten (10) students who had undergone Chemistry 70.

A Physical Chemistry teacher was needed in the study to provide feedback on experienced difficulties of the students and the possible causes or reasons that made Physical Chemistry difficult from their own perspective.

Through the said interviews and the gathered experienced difficulties of both students and teachers when they took up and taught Physical Chemistry, revealed the deepest reasons of difficulties.

Data Gathering Procedure

As soon as the questionnaire had been face-validated by the researchers' adviser and Physical Chemistry educator, respondents were requested to answer the formulated questionnaire and checklist. For those respondents who were not in the vicinity of Iligan City, they were contacted via cell phone, Facebook chat or video call, asking them regarding their difficulties on the five (5) chapters in Chemistry 70 by ranking the topics based on the levels of difficulty from the least to extreme difficulty.

In Part B, the respondents were to put a check mark on the the reasons or causes for difficulties they have personally encountered in Introduction to Physical Chemistry. There were 4 classifications of possible reasons or causes that the respondents experienced while taking Physical Chemistry: 1) student factors; 2) teacher factors; 3) personal factors; and 4) resource factors.

Student factor is about how the student performed and behaved themselves during the subject.Criteria that comprised student factors were the readiness and preparedness of the student on the basic concepts, their understanding of the lesson during class discussion, how they cooperated and participated in class discussion, how they aimed at getting good grades and how they reacted if the class was cancelled/interrupted or the teacher was not present.

Teacher factor is how instructors present the lesson to their students effectively and keep the positive relationship between them. Under this factor were: relationship established by teacher with his/her students, how firm the teacher was in making decisions, the openness of the teacher to suggestions and opinions raised by the students, the usefulness of the various tools, strategies and techniques used in presenting the lesson, and how the subject matter was systematically presented.

Personal factor describes students' issues regarding the relationship within their families, financially stability, as well as the spiritual, physical and emotional aspects in their personal lives. Criteria that belonged to personal factors were how the parents were concerned with their studies, an established relationship with their classmates, handling time management, taking other responsibilities to support their study, and being bothered from the other things aside from studying.

Lastly, resources factor mentioned the learning materials that the student needed for the subject as guide or source of information. Resources factors involved: books being sufficient to cater the needs for learning, giving hand outs to the learner, using PowerPoint presentations as they presented the lesson, incorporating technology as one of their resources in solving problem sets and establishing peer tutoring with their classmates in comprehending the concepts and even in doing calculations.

In part C, the students underwent an in-depth interview and were asked various questions regarding their experiences when they took Physical Chemistry. The researchers also asked them on how they handle the difficulties they experienced in those times. After knowing the difficulties that students experienced, the researchers proceeded to interview the Physical Chemistry educators to know also their insights on teaching Chemistry 70. The researchers asked the educators regarding the students' performance and what were their responses to the difficulties experienced by their students. In-depth interviews between the students and Physical Chemistry educators were conducted to find the difficulties experienced by each individual, as a student or teacher in Chemistry 70, and how Physical Chemistry educators could help their students to overcome such difficulty.

After the interview with the students through Facebook and via call, the researchers gathered all the data they obtained from the interview. The data were assessed and evaluated through interviewing the educators. The interview conducted on the teachers included their experienced difficulties in handling the students and the course in general. It was followed by the gathering of answers from the respondents and teachers, compared and listed the congruent responses or significant findings using the triangulation method to successfully assess the responses by both the student-respondents and the Physical Chemistry educators, also known as "mix method" (also known as triangulation) research. The purpose of the triangulation was to give more detailed information in facilitating deeper understanding of the situations between the teachers and students. After analysis, formulation of learning enhancement on Physical Chemistry was done.

The answers given by both student-respondents and Physical Chemistry teachers were recorded including the conversation at Facebook or voice recorder and were then evaluated.

Findings/Analysis

Out of the ten (10) BSE-Chemistry respondents, four (4) or 40% were very good performers with grades ranging from 1.50 to 1.75; one (1) or 10% was a good performer with a grade of 2.25; three (3) or 30% satisfactorily performed with grades 2.50-2.75; and two (2) or 20% got a passing grade of 3.00. However not one excelled in Chemistry 70.

Out of the five (5) items in the difficulty scale and ranking, Chemical Thermodynamics and Equilibrium resulted as the most difficult topic while the Ideal and Real Gases was the least difficult among the topics in Chemistry 70.

Among the four (4) factors, the top ranking reason or causes that made the Introduction of Physical Chemistry difficult was the teacher factor, followed by the student factor, personal factor and lastly, the resources factor.

Nine (9) out of the total ten (10) respondents said that Chemistry 70: Introduction to Physical Chemistry was indeed a difficult subject. Problem solving, analyzing concepts, and teaching methods were possible reasons that made Chemistry 70 hard to understand. For them, to overcome difficulty in Chemistry 70, students must not only depend on what the teacher had given but also look for other resources in the library or internet, solve problem sets constantly, and utilize peer tutoring.

Academic performance (grades) of the students did not significantly affect the factors that caused them difficulties. On the other hand, the factors that caused them difficulties significantly affected the students' academic performance in Chemistry 70. But there was a significant relationship between the factors and the academic performance of the students in Chemistry 70 based on the analysis of the gathered data.

Teachers in Chemistry 70 found the topics difficult to teach and challenging. They felt that their students had trouble especially that the subject covers theories and concepts that involve calculations, more so that Chemistry 70 was not the field of specialization of the teacher handling the subject.

Recommendation

1. Teachers must help students in the improvement of the latter's academic performance in Chemistry 70: Introduction of Physical Chemistry by not depending on only one (1) book but also look on other references;
2. The Physical Chemistry teacher/s must not focus on only one method of teaching but find other ways to present the lesson more effectively by utilizing multimedia facilities/resources;
3. Advise to shift will be given or provide enhancement if the student gets a failing grade in Math 2 and Chemistry 15, as these are the most basic subjects of this course;
4. Chemistry 70 should be taught not only as requirement for passing the subject but also to appreciate its very vitality to actual life situations;
5. There should be a continuum in developing students' mathematical skills in all aspects (laboratory and lecture sessions) as strong support to understand Chemistry subjects. With this, the teachers need to clarify the significance of the mathematical techniques in imparting lessons directly related to Chemistry;

6. Teachers in Mathematics should introduce the essence of having such calculations in the students' respective courses especially for the BSE-Chemistry students for them to be able to integrate it in their careers as future educators; and lastly,
7. It is recommended that more studies be done in the future with more sets of BSE-Chemistry students in Physical Chemistry as respondents so as to support and enhance further the results of this study.

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Investigating the Transition of Grade 10 Accounting Learners: Educational Implications in South Africa

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Abstract

This study investigated the transition *of Grade 10 Accounting learners in the subject Accounting Equation in the Free State Province in South Africa.* Thirty Grade 10 Accounting learners participated in the study. The respondents comprised seventy percent female, Grade 10, Accounting learners, in secondary schools in the Free State Province in South Africa. Five open-ended questions were used in the study. Firstly, the answers given were divided into two: correct and incorrect. Then, incorrect answers were split into sub-categories and tabulated. Learners' work samples were used to identify, classify, and describe learners' general ledger errors. Seventy-four percent of learners in the study were unable to correctly solve a task involving the general ledger. The following types of errors were commonly identified across the sample: a lack of learners' understanding of the Accounting Equation, classification of accounts, lack of understanding with regards to increase and decrease, and a lack of understanding of, or distinction between, account debited and accounts credited. Final results and conclusions included research suggestions and practitioner-based implications for teaching the Accounting Equation in South African secondary schools.

Keywords: *Accounting Equation, Credit side, Debit side, Learners, Mistakes,*

Introduction

This study investigated the transition *of Grade 10 Accounting learners in the subject Accounting Equation in the Free State Province in South Africa*. In Grade 9, Accounting is offered as part of the subject EMS. EMS draws from broad disciplines such as Accounting, Business Studies and Economics, and has been developed to ensure that learners are equipped with critical thinking, communication, mathematical, collecting, analysing and organising skills (Department of Basic Education(DBE), 2008).

Accounting learners in South African schools have difficulty in understanding and applying Accounting principles because they begin Accounting as a separate subject in Grade 10. Particularly relevant is principle of the double entry in Accounting, which involves whatever is done to the debit (left) side of the Accounting equation must also be done to the credit (right) side of the equation.

Literature review

Warren, Reeve, and Jonathan (2014) state that the Accounting equation can be considered as the foundation of financial Accounting. It shows, on one hand, the resources owned by the business and, on the other hand, claims over the assets (how the assets are financed or who supplied the assets). The accounting equation is a mathematical expression used to describe the relationship between the assets, liabilities and owners' equity of the business model. The basic

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Accounting equation states that assets equal liabilities and owners' equity, but can be modified by operations applied to both sides of the equation – for example, assets minus liabilities equal owners' equity (Abrams, 2010).

The Accounting equation is: Assets = Liabilities + Shareholder Equity. The balance sheet is a complex display of this equation, showing that the total assets of a company are equal to the total of liabilities and shareholder equity. Any purchase or sale by an Accounting equity has an equal effect on both sides of the equation, or an offsetting effect on the same side of the equation. The Accounting equation is also written as liabilities = assets – shareholder equity and shareholder equity = assets – Liabilities (Cloete and Maritmuthu 2008).

Understanding of the Accounting equation must involve understanding its three parts. First are the assets – these are anything that a company owns. Good examples of assets are cash, land, buildings, equipment, and supplies. Money that is owed to a company by its customers, known as accounts receivable, is also an asset (Cornelius and Weyers, 2011).

The final component of the Accounting equation is owner's equity. Owner's equity is the amount of money that a company owner has personally invested in the company. Initial start-up cost of a company that comes from the owner's own pocket is a good example of owner's equity (Cornelius and Weyers, 2011).

The middle component is liability – the obligation of a business towards its creditors (i.e. those who have provided loaned cash or loaned assets). Settlement of liabilities results in an outflow of assets. Common liabilities are accounts payable, salaries payable, taxes payable, etc. (Dempsey, Watson, Joubert and Britz, 2011)

Procedure

The data were collected from 30 Grade 10 Accounting learners of secondary schools in the Free State Province of South Africa, using the Accounting tasks which were distributed to the learners. The aim of giving the learners these Accounting questions was to determine whether mistakes resulted from calculation errors or from misconceptions. Cohen, Lawrence, Morrison and Keith Cohen (2007) reveal that, for many good reasons, the questionnaire is the most widely used technique for obtaining information from participants.

Questionnaires were administered in the classroom by the researcher and collected immediately after they were completed by the Grade 10 Accounting learners. Permission had been granted by the Department of Basic Education, Free State Province. Participants assented to the study in writing. The names of participants were not identified for ethical reasons. Maree and Van der Westhuizen (2009) highlight the ethical considerations in a research – an essential ethical aspect is that of the confidentiality of the results and findings of the study and the protection of the respondents.

Learners' solutions were examined under three categories: correct, incorrect and no solution. Those solutions which were considered incorrect were examined in detail in order to focus on the reasons for the mistakes which had been made.

Findings

This section provides the findings of the study and relevant comments on these findings. In the study, each question was examined separately and the acquired data were presented in a table. Learners were supposed to enter the transaction on the Accounting equation as follows.

Table 1:

Account debited	Account credited	Assets	Owners' Equity	Liability

Tasks: Given to Grade 10 Accounting learners

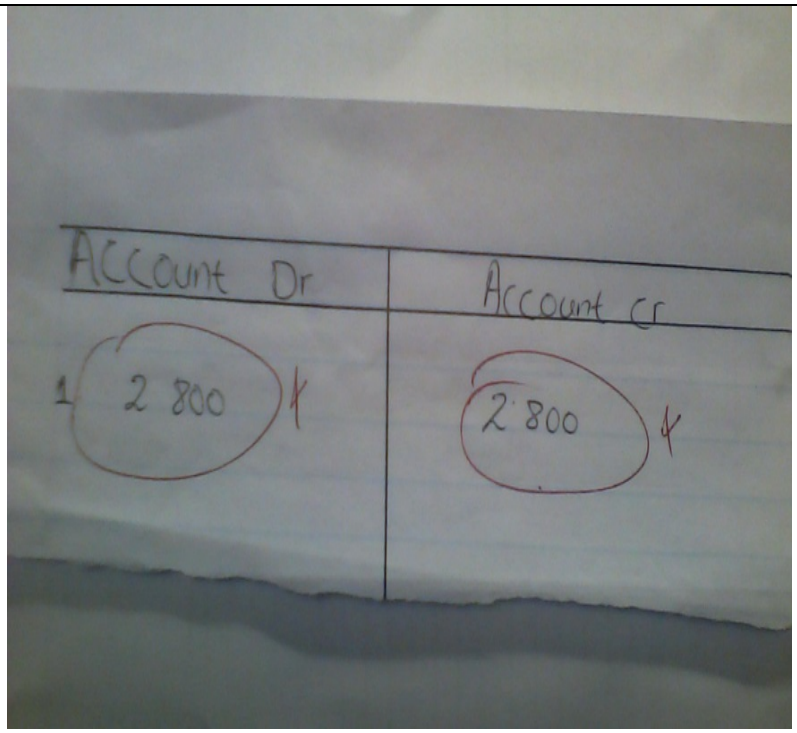
1.1. Bought computer for R2 800 on credit at ABC store

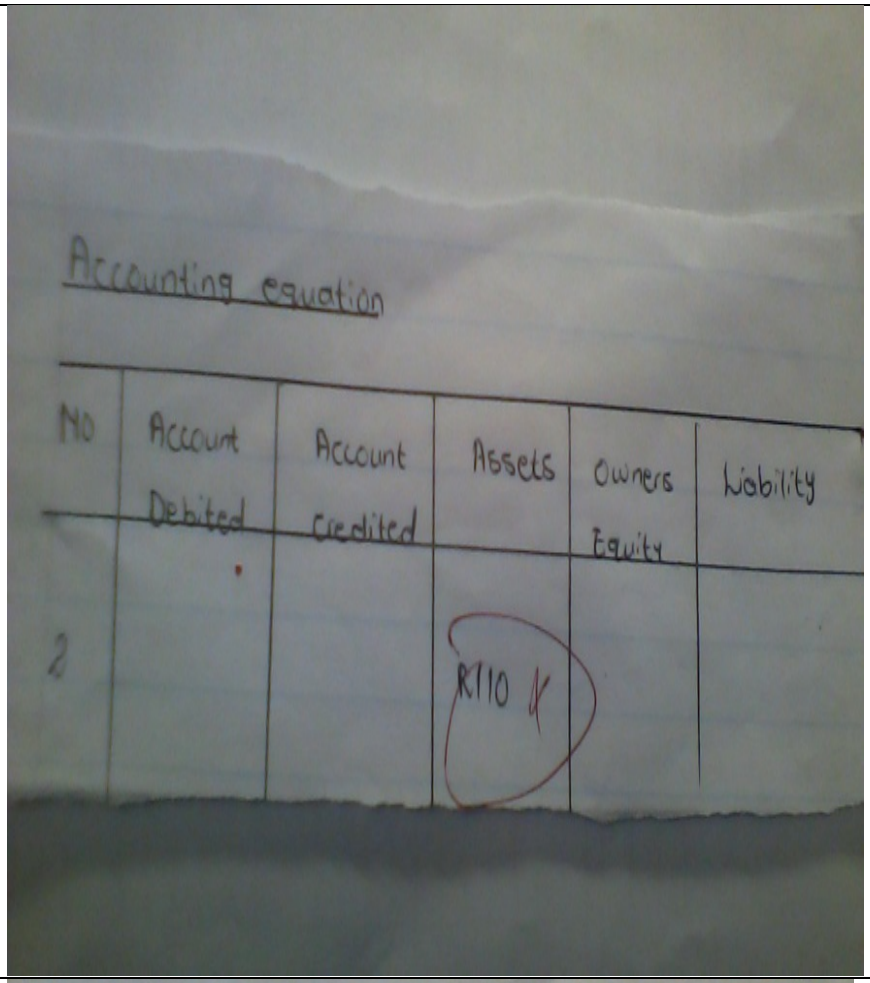
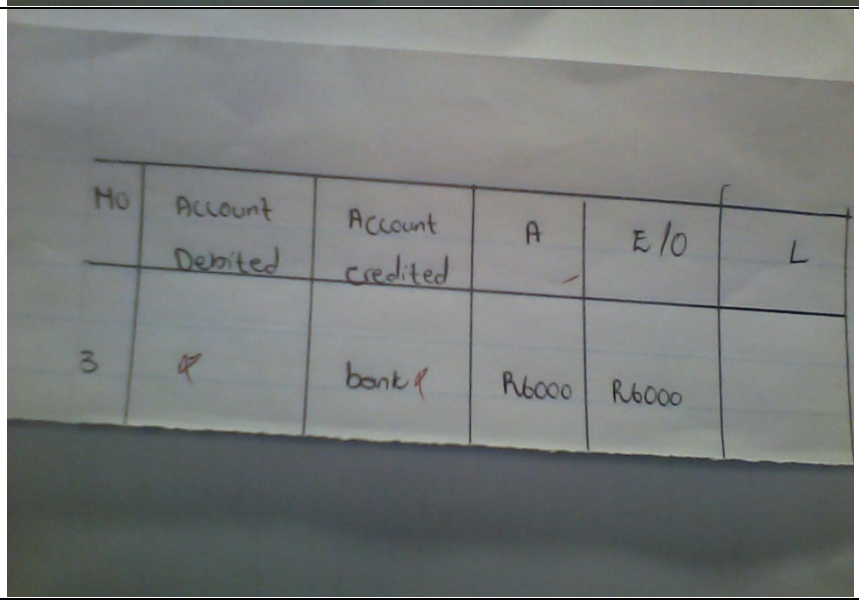
1.2. Bought stationery from CAN store traders and paid by cheque no 101 R110

1.3. Rendered* services on credit to CDC Private Company amounted to R6000

1.4. Drew a cheque for R1200 to pay creditors

1.5. Cash received for service rendered from Van Wyk R2600

Findings	Wrong solution	Learners Comments
S/he does not know the meaning of account.		Learner cannot differentiate between the account and amount; instead of writing bank and equipment, they write an amount.

S/he cannot identify the accounts involved in the transaction.		In one transaction, two or more accounts are involved, and in this case s/he cannot identify the account involved in the transaction; learners showed the effect in Assets only.
S/he cannot identify the account that must be debited and credited.		Learners must analyse the transaction and identify the account that must be debited and credited; it is difficult for some learners to identify the account debited and credited.

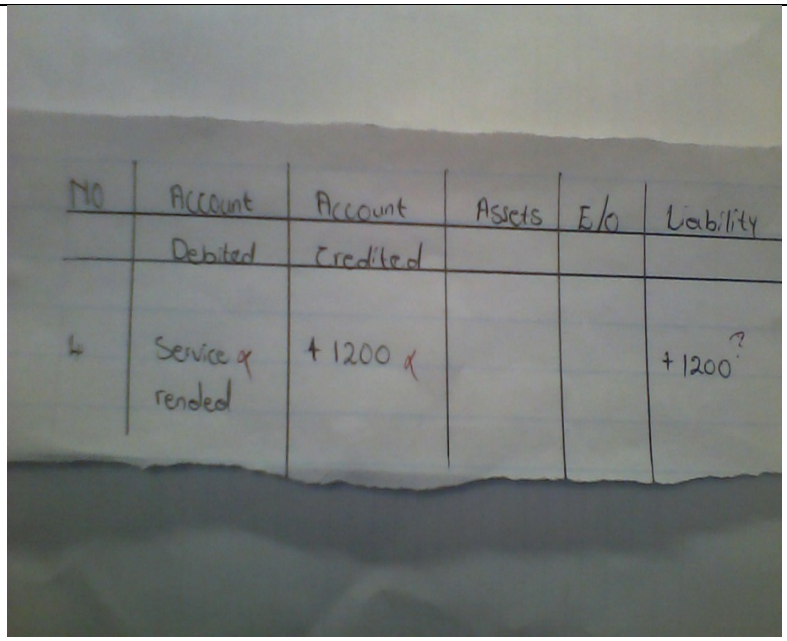
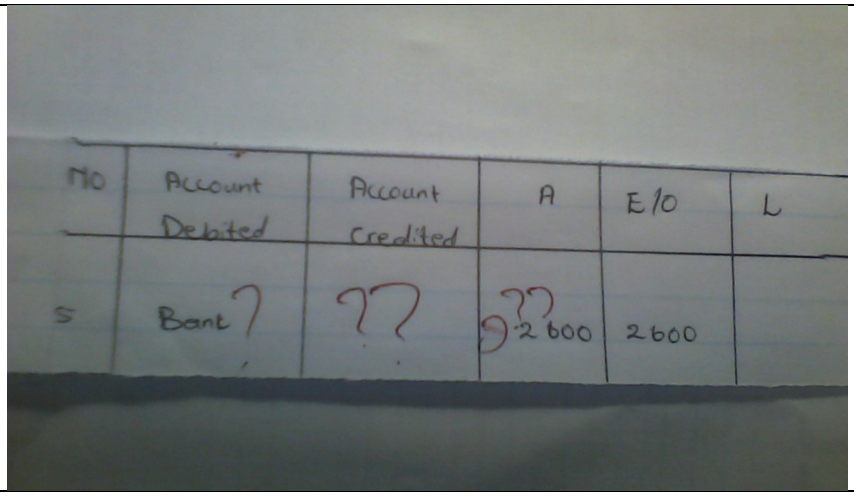
In this situation, s/he cannot differentiate between assets, owners' equity and liability.		Learners must show the effects in the assets, equity and liability; it is difficult for some learners to record the amount under the correct heading according to the table given to the learners.
Sometimes it is difficult for learners to identify whether it is an increase or decrease.		Learners must indicate whether the account increases (+) or decreases (-).

Table 2. Evaluation of learners' solutions (Grade 10 Accounting learners in the Free State province)

Question 1.1	Correct	Incorrect	No solution
Number of learners	10	20	-
%	33	67	-
Question 1. 2	Correct	Incorrect6	No solution
Number of learners	9	21	-
%	30	70	-
Question 1.3	Correct	Incorrect	No solution
Number of learners	20	10	-
%	67	33	-
Question 1.4	Correct	Incorrect	No solution

Number of learners	15	15	-
%	50	50	-
Question 1.5	Correct	Incorrect	No solution
Number of learners	13	17	-
%	43	57	-

Comments on each question

Question 1.1

The results showed that 33% of learners solved this question incorrectly. It was detected that the learners could not differentiate between account and amount, and, instead of writing the name of the account, the learners wrote the amount. DBE (2014) states that teachers need to train learners to express themselves clearly and simply where comments or explanations are required, since the interpretation of the transaction is a problem because learners are using a second language, namely English.

Question1.2

According to the results, 30% of learners recorded the information incorrectly. It was difficult for some learners to identity the account involved in the transaction. Analysis of the transaction is still a challenge for most of the learners. Learners must be able to interpret the transaction and understand the account involved in the transaction (DBE, 2011). Koehler, Mishra and Yahya, (2007) point out that the ability to think critically, reason in a variety of ways and solve problems is necessary for learners in Accounting.

Question1.3

50% of learners solved this question incorrectly. Based on examination of the incorrect answers given, it was clear that learners could not apply principles correctly – could not identify which account must be credited and debited according to Accounting principles. Teachers should ensure that learners have sufficient practice of questions involving the Accounting Equation; moreover, teachers must also answer these questions themselves in order to improve their own confidence and ability to deal with each topic (DBE, 2014).

Question1.4

Results showed that 33% of learners solved this question wrongly. Learners could not differentiate between assets, owners' equity and liability. Learners recorded the account on the wrong side. The most vital concepts are those contained in the expanded Accounting equation: assets + expenses+ drawings = capital + Income + liabilities. It is important for learners to appreciate the difference between different types of assets, different types of liabilities and different types of activities: that is to say, current and non-current assets, current and noncurrent liabilities, and operating, financing and investing activities. Such an appreciation would help them to understand and interpret the transaction and would enable them to prepare and interpret the different transactions and understand the Accounting equation and financial statements more effectively (DBE, 2014, DBE, 2011).

Question 1.5

In the Accounting Equation, the account must increase or decrease and 57% of the learners solved this question incorrectly.

Based on the examination of learners' solutions of questions1.1 to 1.5, it was detected that learners could not apply Accounting principles correctly. Some could not differentiate between income and expenses. The analysis of transaction is still a challenge for learners. They struggle to record the information in the Accounting Equation. (DBE,2013) states that teachers should ensure that learners understand and can explain the essential basic concepts and terminology before engaging in Accounting applications in each topic. These concepts should be introduced gradually at appropriate stages when covering the Economic and Management Sciences curriculum in the GET phase, in order to ensure that learners develop basic Financial Accounting before progressing to Grade 10. Learners who take Accounting in Grade 10 will require additional assistance from their teachers to ensure progress in Accounting in the FET phase (DBE, 2014).

Recommendations

Accounting teachers could use learners' errors, as they would guide teachers on what learners struggle with. Teachers could use strategies such as cooperative learning, meaningful learning and discovering learning to address the problem of the Accounting Equation and the correct application of Accounting principles and concepts in the Accounting Equation. The teacher plays a vital role in avoiding and removing errors that can be made by Grade 10 Accounting learners and in helping Grade 10 Accounting learners to eliminate barriers to learning as soon as possible. Learners must be taught basic Accounting principles at an early age, as a good foundation is important for Grade 10 Accounting learners to master the Accounting Equation. Lastly, teachers' development programmes on how to teach the Accounting Equation and assist Accounting learners are critically needed. Further investigations should also be conducted on the sources of learners' mistakes in Grade 10 Accounting learners in the Free State Province of South Africa.

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Addressing challenges of teaching Grade 9 Accounting Learners in South Africa

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Abstract
This study explores new strategies which address challenges in teaching Economics Management Science (EMS) Grade 9 Accounting learners as an integrated subject in South Africa. Participants were a purposive sample of 12 EMS teachers (female = 58, 3%, Black = 95%, age range 26 to 43 years old). Data were collected using semi-structured individual interviews and questionnaires from the participants. The data were thematically analysed and indicated that a lack of motivation from both learner and teacher effects learner performance. Subject content is a challenge for Accounting teachers, but the research found that making use of cooperative learning can enhance teaching and learning of Accounting to Grade 9 learners in South Africa and that learners can be creative in understanding Accounting concepts.

Keywords: *Accounting, Cooperative learning, Intergrade subject, Strategies, Teaching*

Introduction

This study explored strategies which address challenges in teaching Economics Management Science (EMS) Grade 9 Accounting learners as an integrated subject in South Africa schools. The study proposed cooperative learning as one of the most remarkable and fertile areas of theory, research, and practice in education especially one which exists where learners work together to accomplish shared learning goals (Järvelä, 2011). Cooperative learning would assist Grade 9 Accounting teachers to teach Accounting as an integrated subject in South Africa, a strategy which has also been used in successfully in Mathematics (Brahier,2016).

The Department of Basic Education (DBD) (2011) asserts that the subject Economic and Management and Science (EMS) deals with the efficient and effective use of different types of private, public or collective resources to satisfy people's needs and wants. It reflects critically on the impact of resources exploitation on the environment and the people. The subject EMS deals with the effective management of scarce resources in order to maximize profit. The subject is practical and equips learners with real life skills for personal development, and also benefits the community. The activities given to learners should contribute to their personal development, as well as sustainable growth, and the community should also benefit (DBE: 2011). EMS consists of three subjects, namely Accounting, Business Economics and Economics. The combination of these three subjects must be handled by one teacher who is expected to be an expert in all three learning areas. Modise (2016:291) asserts that EMS teachers concentrate on Business and Economics only and ignore Accounting, mainly because of lack of knowledge of Accounting.

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Literature review

Assisting Accounting teachers

Researchers such as Vang (2012:2), as well as Peer and Reid (2012), claim that certain instructional techniques are necessary to develop the full potential of Grade 9 Accounting learners in the regular classroom. Teacher training should empower the teacher to recognise and promote the needs of the individual learner in such a way that they do not disadvantage the interests and needs of other learners (Page & Page, 2015).

The problem of Accounting learners is that they need certain specific instructional techniques in order to develop their full potential as Accounting learners. Collier (2011) asserts that Accounting learners should be accommodated in the regular mainstream classroom. This study proposes that, even in the diversity of regular classrooms, teachers can provide for the interests and needs of Accounting learners by means of the cooperative learning approach, without neglecting or ignoring the rest of the class and accommodate all learners.The problem can be addressed at the training institution and this sensitivity needs to be instilled during teacher education training. The literature suggests that a cooperative learning strategy could thus be used to support the learning of Accounting in South African schools.

Cooperative learning

Cooperative learning occurs when learners of different cultural, linguistic, educational backgrounds and even different skill levels learn and work as a group together on a common task to achieve a common goal in the content classroom (Gonzalez, 2008; Jin & Cortazz, 2013).Wandberg and Rohwer (2010) assert that cooperative learning has been stated as effective for all types of learners, including academically gifted learners, mainstream learners and learners with learning difficulties, because it promotes learning and fosters respect and friendships among diverse groups of learners in the classroom. In fact, the more diversity in a team, the higher the benefits for each learner if the teacher uses cooperative learning. Learners learn to depend on one another in a positive way for a variety of learning tasks and, at the same time, share the ideas in a cooperative learning (Järvelä, 2011). Cooperative Learning activities encourage peer interaction and relationships with regard to learning and teaching. Learners talk to each other, share together, construct knowledge together and work together, which help the development of language and the learning of concepts and content in this instance, in the context of the subject of Accounting. It is important to delegate learners to different teams so that they can exchange ideas and at the same time benefit from English language role models who are fluent in English (Daradoumis, Demetriadis & Xhafa, 2012).

Procedure

Data were collected from twelve (12) EMS teachers (E1-E12) (female=60%), who are teaching EMS in Grade 9 in the Lejwelephutswa District in the Free State Province of South Africa. They were selected using the guidelines of purpose sampling (Jonson & Christensen, 2012:231). These teachers were selected for the following reasons: (1) they were experienced in teaching EMS, (2) they agreed to participate in the study and (3) they were accessible to the researcher. There are necessarily limitations inherent in this study. The study used a relatively small sample of ten EMS teachers, which may well limit generalization (Jonson and Christensen, 2012). Also, the semi-structured interviews and questions used to collect the data

from the respondents elicited information regarding teacher related, learner related and policy related challenges which respondents faced in their work as EMS teachers.

Findings

The subject content is abstract

Accounting teachers and learners lack motivation, which affects academic performance of Accounting learners. Teachers present the subject matter of Accounting in an abstract manner, which makes it difficult for learners to understand Accounting concepts. Teachers transfer the general formula (A= O+L) without any explanation, without showing how or why it came to that point, and without any conclusion. Learners do not understand this formula presented in the classroom by teachers – namely, Assets, Owners' Equity and Liability (A=O+L) (Cornelius, 2011)

"I have a problem in teaching Accounting because I am not familiar with Accounting" (Respondent #12).

"I normally ask a teacher who is good in Accounting to come and teach Accounting aspects in my classroom" (Respondent #6).

"Accounting is not my favourite subject, it is difficult, therefore I cannot teach it, and I am good in in Business Studies and Economics only"(Respondent #4).

"I concentrated a lot in two subjects only because I cannot teach Accounting" (Respondent#8).

To connect with these learners in the Accounting classroom, teachers must learn to speak their language and become conversant with the technology that comes so naturally to the learners. The integration of technology into the Accounting classroom means tapping into learners' interests and strengthening the teachers' technical skills, all the while providing enriching learning opportunities for Accounting learners (Tan, 2015). Teachers must be creative in teaching Accounting because there is a wealth of unused information that can be used to teach Accounting learners (Hopkins, 2015:158). The culture and background of learners can be utilised to teach Accounting learners who, at the same time, can be involved in the learning process (Wilson, 2014).

Teaching method

Teaching methods can establish the teacher as the authority in the Accounting classroom and thus prevent learners from participating and discouraging them from asking questions. Learners are afraid to engage the teacher and at the same time are intimidated and withdraw from the centre of teaching and learning because they are not performing well in Accounting (Blustein, 2011).

"I narrate to the Accounting learners because I think it is an easy method for learners" (Respondent #5).

"I sometime involve the learners in the classroom" (Respondent #8).

The majority of the learners cannot speak in the classroom and to engage them is very difficult" (Respondent #3).

"To save time I am using telling method to the Accounting learners" (Respondent #11).

"Since learners cannot express themselves in English, it is difficult to engage them" (Respondent #2).

"I know learners who can participate in the class therefore I rely on those learners in Accounting classroom" (Respondent #12).

Accounting learners learn to express themselves with greater confidence when working in small teams. In addition to 'picking up' vocabulary, Accounting learners gain from observing how their peers learn and solve Accounting problems. Using the cooperative learning technique, learners of different linguistic and educational backgrounds and different skill levels can work together on a common task for a common goal either in the language or in the classroom settings (Gonzalez**,** 2008:152). Presenting information involves the organisation, formatting and verbalisation of knowledge conveyed through cognitive tools **(**Alexander, 2013).

Recommendation

It was found that using cooperative learning could help Accounting learners to be creative in understanding and approaching Accounting questions and at the same time enhance the teaching of Accounting. It would also help learners to discover and understand the Accounting concept, Accounting principles and Accounting content. The background environment of learners is rich in Accounting content and this can help them to become actively involved in the Accounting classroom. Cooperative learning assists and motivates learners to interact with one another, solve problems together, and at the same time share ideas and motivate one another.

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Common Misbehavior of Pupils in the Classroom: How Teachers Handle It

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Abstract

This study aimed to examine the misbehaviors of pupils in the classroom, and to identify the most common, disruptive, and unacceptable student problem behaviors and how the teachers handle it. One hundred teacher-respondents were randomly selected from Iligan City Central School to serve as subjects of the study during the school year 2016-2017.

It was found out that most of the respondents were 28 to 38 years old, majority of the teachers were female, most of them were married, BEED graduates and specializes in General Education. The most common misbehavior of pupils were having conversation during class while the most disruptive misbehavior was changing seats, the most grave was disturbing other classmates. Teachers considered talking to parents as the most effective way of handling misbehavior while changing the lesson plan as the least. There was no significant relationship between misbehaviors of the pupils and the teachers' age, sex, civil status, year graduated, grade level taught, and years in teaching, but there was a significant relationship between misbehaviors of the pupils and teachers' specialization, major factors: environment, family and cultural background were considered in the development of the pupils' behaviors.

Keywords: *Behavior common misbehavior, unacceptable student problem*

Introduction

A child's behavior may differ, depending on which environment he lived in. It can also be observed inside the classroom. When a child behaves inappropriately, it is called pupil's misbehavior. According to Sun and Shek (2012) Pupil's misbehavior is interpreted as disruptive and improper behavior that adversely affects the order, teaching, and learning in classroom, it is also important to note that pupil misbehavior varies across cultures.

Pupil behavior is the main concern of teachers for the past decades. Especially these recent days as children had become even more unruly and misbehave inside the classroom compare to the children from the past as stated by Willis(1996)."There's no question that it's tougher today for teachers," says Pete DeSisto, director of the Cooperative Discipline Foundation in Easley. While most experts agree that classroom management poses bigger challenges today than in the past.

Pupils misbehavior causes challenges to classroom management, hence the conduct of this study, with the primary purpose to investigate on the common misbehaviors among pupils in

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the classroom and how teachers handle these behavioral problems, with teacher-respondents coming from Iligan City Central School during the school year 2016-2017.

Statement of the Problem

Regular classes are compromised if learners misbehave and act inappropriately during discussions. Many teachers are seeking new approaches to classroom management that's not only work better but also teach better lessons thus, this study sought to answer the following questions:

1. What is the profile of the teachers?
2. What are the different misbehaviors done by the pupil in the classroom in terms of:
    2.1 the most common
    2.2 the most disruptive
    2.3 the grave
3. What are the different ways of handling behavior problems in the school?
4. Is there a significant relationship between the misbehaviors of pupils and the teachers 'profile

Review of Related Literature

A teacher's role in the classroom is not limited to assess and evaluate academic achievements but their behavior as well due to the fact that total teaching-learning process intends to develop the young minds holistically, that is both in the cognitive and affective aspects, even extending up to the psychomotor development, thus classroom and behavioral management has become a prime concern of every teacher (Sabornie, 2010).

Classroom management has persisted for decades. Many new teachers find difficulty in having an effective classroom management. Well, in fact, management of the classroom and students are skills that take minimum years of experience to be acquire and develop. The skills associated with effective classroom management are only acquired with practice, feedback, and a willingness to learn from mistakes. There is no best solution in every classroom setting, but teachers of many years of experience have understand what works and doesn't works in managing classroom and handling students behavior (Kizlik, 2015).

Many have studied in finding the ways and means in handling learners behavioral problems. Many have attempt in establishing the best approach in handling misbehaviors, but until now, misbehaviors are still the main concern of teachers especially to these days where students are unruly and sometimes unsubmissive. The purpose of implementing classroom management strategies is to enhance prosocial behavior and increase student academic engagement (Emmer & Sabornie, 2015; Everston & Weinstein, 2006). Effective classroom management according to Kratochwill, et. al.,(2012) of Classroom Management, establishes and sustains an orderly environment in the classroom, increases meaningful academic learning and facilitate social and emotional growth, decreases negative behaviors and increase time spent academically engage.

Research Design and Methodology

Descriptive study was employed in the survey with adapted quantitative checklist used in random sampling considering the entire population of teachers Iligan City Central School, Iligan City.

Instruments Used

The study used quantitative method in gathering the data. The researchers adapted and modified the study of Sun and Shek (2012), with the questionnaire composed of 4 parts: Part

one - profile of teachers, this includes the name, age, gender, civil status, degree, major, year graduated, grade level taught and years of teaching. Part two - list of misbehaviors done by the pupils in the classroom and is answerable by putting a check on the table specified. Part three includes the standardized test for core self-evaluation developed by Erez& Judge, (2001); Judge & Bono, (2001); Judge et. al., (2000); Judge, Locke, et al., (1998). It consists of 12 items using likert scale having responses ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). Part four includes how teachers handle the pupils' misbehaviors in the classroom. For content validation the questionnaires were examined by the professional experts from their own field of specialization.

Results and Discussion

Table 1. Profile of the Respondents

Age (years)	Frequency	Percentage
28 – 38	53	53
39 – 49	35	35
50 – 61	18	18
Total	100	100
Mean	41.5	
Sex		
Male	6	6
Female	94	94
Total	100	100
Civil Status		
Single	14	14
Single parent	4	4
Married	78	78
Widowed	4	4
Total	100	100
Degree		
BEED	86	86
BS/BEED	2	2
BSED	6	6
BSIED	6	6
Total	100	100
Specialization		
English	30	30
Mathematics	16	16
Biology/English	2	2
HELE/English	2	2
Industrial Arts	5	5
Science	2	2
HELE	6	6

Social Studies	2	2
General	35	35
Total	100	100
Year Graduated		
1986-1990	21	21
1991-1995	22	22
1996-2000	22	22
2001-2005	18	18
2006-2010	16	16
2011-2015	1	1
Total	100	100
Grade Level Taught		
Kindergarten	6	6
Grade 1	19	19
Grade 2	18	18
Grade 3	15	15
Grade 4	13	13
Grade 5	13	13
Grade 6	16	16
Total	100	100
TABLE 8		
Years of Teaching	Frequency	Percentage
1 – 10	43	43
11 – 20	33	33
21 – 30	22	22
30 – 40	2	2
Total	100	100

Table 1 presents the profile of the respondents in terms of Age, Sex, Civil Status, Degree, Specialization, Year Graduated, Grade Level Taught and Years of Teaching correspondingly. Most respondents were 28 to 38 years old, majority of the teachers in Iligan City Central School were females having 94 out of the 100 respondents, most of them were married, BEED graduates, 35 were major in General Education and 30 were English majors, graduated during the school year 1985-2000 but not evenly distributed by grade level taught, and only 43 teachers had 1 to 10 years length of teaching.

Table 2. Misbehavior of the Pupils in the Classroom

Misbehaviors	Mean	Interpretation	Rank
1. sleeping during classes	2.75	Once a month	19
2. Shyness/Nonparticipation	3.33	Once a month	9
3. Having conversation (during class)	4.63	Twice or more than twice a week per month	1
4. Tardiness, leaving frequently during classes	2.54	Once every quarter	22

and cutting classes			
5. Arguing	3.66	Once a week per month	3
6. Whining	2.93	Once a month	14.5
7. Being negative	2.39	Once every quarter	23
8. Threats on physical violence towards the teacher or classmates	1.63	None at all	32
9. Suicidal/homicidal threats	1.12	None at all	34
10. Asking nonsense questions	2.69	Once a month	20
11. Rudeness (Talking back, arguing with teacher, verbal offense)	1.73	None at all	30
12. Dealing, playing and attending with personal stuff	2.93	Once a month	14.5
13. Irrelevant drawing	2.77	Once a month	18
14. Gossiping on (teachers, classmates)	2.30	Once every quarter	25
15. Cursing directed at the teacher/classmates	1.55	None at all	33
16. Quarrelling with classmates (verbal aggression)	3.10	Once a month	12
17. Speaking foul language (cursing)	2.02	Once every quarter	27
18. Teasing classmates	3.37	Once a month	8
19. Changing seats	3.56	Once a week per month	4
20. Disobedience/Refusing to carry out instructions	2.91	Once a month	16.5
21. Wandering around the classroom	3.22	Once a month	10
22. Playing	3.80	One a week per month	2
23. Clowning/ making fun of others	3.11	Once a month	11
24. Failure in submitting assignments	3.40	Once a week per month	7
25. Non-attentiveness (looking out of the window)	2.91	Once a month	16.5
26. Non-verbal communication (paper tossing around the classroom)	2.63	Once a month	21
27. Destroying things	1.78	None at all	29
28. Isolating Classmates	1.66	None at all	31
29. Making noise (rocking the chairs, singing)	3.53	Once a week per month	5
30. Copying homework	2.97	Once a month	13
31. Disturbing other classmates	3.46	Once a week per month	6
32. Invasion of privacy (reading private letters that is not his/her belonging)	1.82	Once every quarter	28
33. Usage of electronic devices, (for texting, playing games, surfing and listening to music)	2.10	Once every quarter	26
34. Irrelevant Drawing	2.37	Once every quarter	24
Overall Mean	2.73		

Table 2 summarizes the misbehavior of the pupils in the classroom. The most common misbehavior according to teachers was having conversation during class which occurs twice or more than twice a week per month. This support the claims of Sun and Shek(2012), their study find out that the most common misbehavior was talking out of turn, particularly in the form of disruptive conversation. The psychological and developmental reason contributes to this behavior. On a neurological sense, the brain continuously develop by which the pupils cannot control which resulted changes among pupils that may include increased need for social interaction and emergence of higher-level control over cognition. The lack of psychological and social maturity among pupils is also factors in the talkative nature of the pupils (Concordia University, Teaching Strategies, 2013).

Table 3.Misbehaviors Classified as Either Disruptive or Grave

Misbehavior	Disruptive	Grave
1. Sleeping during classes	70	4
2. Shyness/Nonparticipation	82	4
3. Having conversation (during class)	92	4
4. Tardiness, leaving frequently during classes and cutting classes	71	25
5. Arguing	93	1
6. Whining	79	1
7. Being negative	80	3
8. Threats on physical violence towards the teacher or classmates	34	56
9. Suicidal/homicidal threats	33	59
10. Asking nonsense questions	83	4
11. Rudeness (Talking back, arguing with teacher, verbal offense)	43	47
12. Dealing, playing and attending with personal stuff	70	24
13. Irrelevant drawing	68	21
14. Gossiping on (teachers, classmates)	51	42
15. Cursing directed at the teacher/classmates	30	53
16. Quarrelling with classmates (verbal aggression)	68	26
17. Speaking foul language (cursing)	34	61
18. Teasing classmates	77	19
19. Changing seats	98	0
20. Disobedience/Refusing to carry out instructions	46	0
21. Wandering around the classroom	84	2
22. Playing	88	0
23. Clowning/ making fun of others	66	22
24. Failure in submitting assignments	89	4
25. Non-attentiveness (looking out of the window)	79	2
26. Non-verbal communication (paper tossing around the classroom)	68	0

27. Destroying things	58	33
28. Isolating Classmates	51	36
29. Making noise (rocking the chairs, singing)	87	0
30. Copying homework	70	2
31. Disturbing other classmates	21	74
32. Invasion of privacy (reading private letters that is not his/her belonging)	47	46
33. Usage of electronic devices, (for texting, playing games, surfing sand listening to music)	95	0
34. Irrelevant Drawing	73	22

Table 3 presents the misbehaviors of the pupils classified as either disruptive or grave. Most of the misbehaviors were disruptive except making threats on physical violence towards the teacher or classmates, making suicidal/homicidal threats, being rude, cursing directed at the teacher/classmates, speaking foul language, and disturbing other classmates which are classified as grave. In the study of Sun and Shek(2012), result revealed that having conversation during class is the most disruptive misbehavior while disrespecting teachers as the most grave misbehavior. This study also showed that the usage of electronic device is the most disruptive followed by arguing and having conversation in class, according to Brockport State University (2013) Electronic Device can be disruptive in the classroom in a number of ways and they should not be abused. This implies that the digital age is taking a toll on the learning of the pupils inside the classroom. Thus electronic devices should be limited in the classroom and should only be used on learning activities.

Table 4. Ways of Handling Misbehaviors

Ways of Handling Misbehaviors	Frequency	Rank
Talking to the parents	98	1
Establish classroom rules	96	2.5
Call the pupil's attention	96	2.5
Give clear policies from the beginning	94	4.5
Praising and giving responsibility to the pupils	94	4.5
Give eye contact to the pupil who misbehaved	93	6
Give the pupil a warning	92	7
Collect distracting objects from the pupil	82	8
Tell the pupil quietly to remain after the end of the class to discuss about the misbehavior	77	9
Move the pupil's seat away from distracting peers	73	10
Staying calm and professional during the situation	70	11
Use nonverbal cues to alert the pupils	69	12
Give consequences to those who consistently do misbehaviors	67	13
Asking questions	61	14
Give incentives to reduce common misbehaviors	59	15
Give the pupil a punishment	54	16
Scare the pupil that you will tell his/her parents if he/she continues misbehaving	53	17

Cooperating with the student	50	18
Changing the lesson plans	10	19

Table 11 presents the ways of handling the misbehaviors of the pupils. The teachers considered talking to the parents as the most effective way of handling misbehaviors, and changing the lesson plans as the least. Clay (2005) discussed that teachers should strive to establish partnership with parents to support student learning. Thus creating a strong communication which is fundamental to the parent teacher partnership. It is easier for the teacher to reduce the misbehaviors of the pupils if the teacher and parent relationship is well established. For example the teacher may tell the parent that his/her son is constantly changing seats and therefore reduces the learning of the pupils, then the parents will reprimand the child and thus reduces the misbehaviors.

Table 5. Relationship between Misbehaviors of the Pupils and Profile of the Teachers

Dependent Variable	Independent Variable	p-value	Remark
Misbehavior of the pupils	Age	0.1514	Not significant
	Sex	0.6239	Not significant
	Civil status	0.1701	Not significant
	Specialization	0.0000	Significant
	Year graduated	0.3369	Not significant
	Grade level taught	0.1741	Not significant
	Years in teaching	0.4633	Not significant

Table 5 reveals the relationship between misbehavior of the pupils and profile of the teachers. There was a significant relationship between misbehaviors of the pupils and profile of the teachers in terms of specialization since the p-value was less than 0.05 level of significance. This means that the misbehaviors of the pupils were affected by the specialization of the teachers. Specialization is defined as the process of concentrating on and becoming expert in a particular subject or skill. It is a well-known technique to boost productivity in many industries. Hence, specialization is link in relation to pupils' achievement. Many studies have provided strong evidences which proved that teachers have a significant influence in students' achievement. In fact, Rivkinet. al. (1998) stated that 'teacher effects' are extremely important in driving student achievement and also Hanushek (1981) claimed that "the only reasonably consistent finding seems to be that 'smarter' teachers do better in terms of student achievement.". Both demonstrated that the effects of schools are mostly driven by variations in teacher quality as stated by Seshadri (2004). This caused him to conclude that privatization encourage specializations of teachers in various skills which would promote a better matching of students and teachers.

Conclusion

It could be concluded that:

1. It was important to understand the current developmental needs of pupils along with factors that contribute to the misbehavior of the pupils in the classroom such as inattention, easy to lose temper and agitation.

2. It was important for teachers to shift their pedagogy from traditional to performance based teaching methodologies specially in gaining specializations on certain subjects as they would be able to focus and should have the most knowledge in that certain subject.
3. It was very important for teachers to have disciplined and organized classroom, as the environment of the children play a crucial role in order to have an effective learning. Regular classes were compromised when learners misbehaved and acted inappropriately during discussions.
4. It would also help in getting some insights on the need to conduct more seminars and programs about classroom management and understanding pupils' needs and the pupils misbehaviors, to help teachers realize that there were different strategies and approaches in handling different kinds of misbehavior of pupil, for new graduate teachers to improve their classroom management skills and give them knowledge on the common behavioral problems and ways in dealing with these problems.
4. There was a significant relationship between misbehaviors of the pupils and teachers' specialization.
5. The teachers considered talking to the pupils' parents as the most effective way of handling pupils' misbehaviors.

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Impact of Information and Communication Technology (ICT) to Pre-Service Teachers

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Abstract

This study aimed to identify the impact of ICT among pre-service teachers of MSU – IIT on teaching – learning process, social and behavioral aspect, emotional aspect, and physical and health aspect. One hundred pre-service teachers of the College of Education were chosen as the respondents of this study conducted during the 1st semester of the SY 2016 – 2017. A quantitative method of research was used in this study. Purposive sampling was used in choosing the subjects of the study. The research instrument used was a standardized questionnaire.

Findings revealed that 51% were 21 years old; 74% females; and 49% of the respondents were from the Department of Science and Mathematics Education (DSME). Mostly, BSED Biology majors; with parents who have a low source of family income; ranked as the eldest in the family; with 4 siblings; taught Science subject; deployed in ICNHS; and rendered 40 hours per week in practice teaching. Study showed that there was no significant relationship between the teaching hours of the pre-service teachers taught in practice teaching and the impact of ICT on teaching – learning process. There was also no significant relationship between the gender and the impact of ICT on social and behavioral aspect and the relationship between the gender and the impact of ICT on physical and health aspect. However, there was a significant relationship between Mathematics and the impact of ICT on the emotional aspect.

Keywords: *Behavioral aspect, health aspect, emotional aspect, physical and social aspect*

Introduction

It has been known from time immemorial that everything in life is like the two sides of a coin, with positive and negative sides of every phenomenon, like Yin-Yang theory of reversal that in every good thing, there can be the bad thing on the opposite

Whether the effect is positive or negative, it can also affect all aspects in life. Say for example, in the field of education, the effects of Information and Communications Technology (ICT) is far reaching and cannot be overemphasized as its lens could view changes on individuals' and organizations' lives in particular, and in society in general (Lindsey, 2016).

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ICT also enhances the development and implementation of policies and procedures necessary to ensure the effective, secured and appropriate use of universities information resources and services. ICT provides a lot of services for students including distance education programs, inexpensive printing, cell phone plans, internet connection, free dial-up, technology equipment, rentals classroom media stations, etc. Lecturers and students get relevant materials needed through the Internet. Such quality materials are used in equipping the students and upgrading their knowledge (Peeraer, 2011), hence the conduct of this study to delve into the identification of the impact of ICT on pre-service teachers in MSU-IIT during their practice teaching in the schools where they were assigned in terms of teaching-learning process, social, behavioral, emotional, physical and health aspects.

Statement of the Problem

The purpose of this study was to identify the impact of ICT among pre-service teachers of MSU – IIT on teaching – learning process, social and behavioral aspect, emotional aspect, and physical and health aspect.

1. What are the demographic profiles of the respondents in terms of:
2. How is ICT (Information and Communications Technology) taught in class?
3. What are the positive and negative impacts of ICT integration in terms of:
    - 3.1 Teaching – Learning Process
    - 3.2 Social and Behavioral Aspect
    - 3.3 Emotional Aspect
    - 3.4 Physical and Health Aspect
4. Is there a significant relationship between the teaching hours of the respondents taught in practice teaching and the impact of ICT on teaching – learning process?
5. Is there a significant relationship between the gender of the respondents and the impact of ICT on social and behavioral aspect?
6. Is there a significant relationship between the subject areas taught in practice teaching and the impact of ICT on emotional aspect of the respondents?
7. Is there a significant relationship between the gender of the respondents and the impact of ICT on physical and health aspect?

Review of Related Literature

Information and Communications Technology (ICT) integration in teacher education and teaching practices of teachers is a complicated and challenging issue. As far as pre-service teachers are concerned, this becomes critical because they need to be equipped with competencies needed for their future teaching practices (Aslan et al., 2014).

Despite the fact that some studies were conducted regarding ICT integration in the classrooms, ICT usage improves learning as results are mixed. much simplified, it would appear that (1) there is some initial impact of using ICT in that students get a wider range of resources and experience some extra motivation, (2) the motivation effect soon fades as using ICT becomes the new normal (3) the wider resource range remains a positive factor (4) there are some well documented positive effects in specific simulation and modelling. Systems that support communication and social interaction will be more effective in enabling users to continue to learn about the functions of the system than those designed to isolate individuals (Watters and Diezman, 2007).

Students may be less likely to remember information if it is followed by something that is strongly emotional. It does seem that memories are treated differently depending on

whether they are associated with pleasant emotions or unpleasant ones, and that this general rule appears to be affected by age and other individual factors. Specifically, pleasant emotions appear to fade more slowly from our memory than unpleasant emotions, but among those with mild depression, unpleasant and pleasant emotions tend to fade evenly, while older adults seem to regulate their emotions better than younger people, and may encode less information that is negative (Morau, 2014).

Design/Procedure

This study used the descriptive research design with quantitative data of research (Wyse, 2011) utilizing purposive sampling in selected 100 respondents due to the nature of research design, aims and objectives using questionnaires in obtaining primary data.

Instruments Used

The questionnaire used in this study was formulated by the researchers and face and content validated by ICT experts. The questionnaire also was subjected to reliability test which included demographic profile, age, gender, address, department, course and major, and contact number of respondents, including family background: parent's occupation and monthly income, number of siblings, and birth order, together with subject areas taught in practice teaching, teaching hours per week in practice teaching, and cooperating school and how ICT (Information and Communications Technology) was taught in class, the positive and negative impact of ICT on Preservice Teachers in the teaching – learning process, social, behavioral, emotional, physical and health aspects.

Findings /Analysis

Table 1. Responses of the Respondents on ICT Integration

Statements	Response Mean	Interpretation
ICT is part of the curriculum.	3.37	Strongly Agree
ICT is taught as a separate subject.	2.96	Agree
ICT is integrated in the practice teaching.	3.39	Strongly Agree
ICT is integrated in the subject that I taught.	3.20	Agree
ICT is integrated in more than two subjects that I taught.	3.03	Agree
Overall Mean	**3.19**	**Agree**

Legend: 1 – 1.75 (Strongly Disagree); 1.76 – 2.5 (Disagree); 2.51 – 3.25 (Agree); 3.26 – 4 (Strongly Agree)

Table 1 shows the mean response of the respondents towards how ICT was taught in class with mean response of 3.37, where respondents strongly agreed in which ICT was part of the curriculum mandated by the CHED curriculum offering and with mean response of 3.39, the respondents had also strongly agreed that ICT was integrated in practice teaching as educative instructional materials for the learners to learn effectively. This could imply that as 21st century skilled teacher, pre-service teachers must learn to adapt to technological advances that would benefit both the teacher and the learner.

Table 2. Impact of ICT in the Respondents on Teaching – Learning Process

Statements	Response Mean	Interpretation
I have a full understanding about what technology is, how it works, what purposes it can serve, and how it can be used to achieve specific goals in teaching.	3.49	Strongly Agree
I have the information and media literacy skills which I exercise analyzing, accessing, managing, integrating, evaluating, and creating information in a variety of forms and media in teaching.	3.36	Strongly Agree
I set goals to learning, plan for the achievement of those goals, and independently manage time and effort in using technology	3.43	Strongly Agree
I convey the discussion to the learners using ICT tools such as MS PowerPoint, audio-visual, Overhead Projectors, and etc.	3.27	Strongly Agree
I access the use of Internet to find information in the discussion.	3.41	Strongly Agree
I integrate technology resources in the classroom which encourages the improvement of the teaching-learning process.	3.38	Strongly Agree
I use interactive ICT tools to enhance teaching-learning process.	3.33	Strongly Agree
I use the Internet to find reliable information.	3.47	Strongly Agree
Using the Internet, it helps in making my lesson plan.	3.46	Strongly Agree
I use the information on the Internet to find any reliable teaching resources suitable for the discussion.	3.39	Strongly Agree
My teaching methodology is enhanced by the use of technology.	3.33	Strongly Agree
ICT tools help me to cater the needs of the different learning styles of the learners.	3.37	Strongly Agree
I integrate presentations with a simple animation function in the learning activities.	3.26	Strongly Agree
I create presentations with video and audio clips.	3.26	Strongly Agree
ICT resources help me to improve the academic performance of the students.	3.33	Strongly Agree
I lack awareness on the technological advances in teaching.	2.02	Disagree
I prefer not to use the technology in teaching when I encounter technical problems.	2.15	Disagree
I do not spend too much time in using information technology to be used in teaching.	2.25	Disagree
I lack sufficient information on how to use ICT as part of teaching.	1.87	Disagree
Overall, there is a positive impact of ICT in the teaching-learning process.	3.47	Strongly Agree

Overall Mean Response	**Positive Statement** (1, 2, 3, 4, 5, 6, 7, 8. 9, 10. 11, 12, 13, 14, 15, and 20)	**3.38**	**Strongly Agree**
	Negative Statement (16, 17, 18, and 19)	**2. 07**	**Disagree**

Legend: 1 – 1.75 (Strongly Disagree); 1.76 – 2.5 (Disagree); 2.51 – 3.25 (Agree); 3.26 – 4 (Strongly Agree)

The Table 2 shows the mean response of the respondents on the impact of ICT in the respondents on Teaching – Learning Process. Based on the data, most of the respondents strongly agreed in all positive statements and disagreed with the negative statements. The statement "I use the information on the Internet to find any reliable teaching resources suitable for the discussion" differ from other mean response in the negative statement because most of the respondents disagreed that they lacked sufficient information on how to use ICT as part of teaching.

Table 3. Impact of ICT in the Respondents on Social and Behavioral Aspect

Statements	**Response Mean**	**Interpretation**
I keep on managing, and creating effective oral, written, and multimedia communication in a variety of forms and contexts in teaching.	3.28	Strongly Agree
I use the information effectively and accomplish these functions using technology, communication networks, and electronic resources.	3.28	Strongly Agree
I use the technology to communicate with the family, relatives and friends.	3.57	Strongly Agree
I am updated on the recent social media posts of the family, relatives and friends.	3.34	Strongly Agree
I spend too much time in browsing the social networking sites such as Facebook, Instagram, Twitter, and etc.	2.66	Agree
I spend too much time on technology which affects the bonding time with the family, relatives, and friends.	2.27	Disagree
Through social networking sites, I encounter misunderstandings with other people.	2.34	Disagree
I text on mobile phones or use an instant messenger to connect other people.	3.48	Strongly Agree
I spend most of the time indoor using technology rather than going outside dealing with other people.	2.46	Disagree
Overall, there is a positive impact of ICT in the social and behavioral aspect.	3.21	Agree
Overall Mean Response **Positive Statement** (1, 2, 3, 4, 8, and 10)	**3.36**	**Strongly Agree**
Negative Statement (5, 6, 7, and 9)	**2.43**	**Disagree**

Legend: 1 – 1.75 (Strongly Disagree); 1.76 – 2.5 (Disagree); 2.51 – 3.25 (Agree); 3.26 – 4 (Strongly Agree)

The Table 3 shows the mean response of the respondents on the impact of ICT on Social and Behavioral Aspect. Based on the data, most of the respondents strongly agreed in all positive statements and disagreed with negative statement. The statement "I use the technology to communicate with the family, relatives and friends." differ from other mean response in the negative statements because most of the students disagreed that they spent too much time on technology which affects the bonding time with the family, relatives, and friends. For the pre-service teachers, they still managed their time spent with their family, relatives and friends.

Table 4. Impact of ICT in the Respondents on Emotional Aspect

Statements		Response Mean	Interpretation
I am responsive to new and diverse perspectives in using the technology.		3.19	Agree
I am happy whenever I use technology.		3.27	Strongly Agree
I am confident to save educational files such as documents, videos, presentations, reports and etc. online.		3.40	Strongly Agree
I feel the excitement to impart learning with the students using ICT in teaching.		3.38	Strongly Agree
ICT makes me confident to impart knowledge towards the learners.		3.35	Strongly Agree
Working with ICT in the classroom usually overwhelms me.		3.20	Agree
The use of ICT increases my satisfaction in delivering the discussion.		3.31	Strongly Agree
I appreciate the potential use of technology in teaching.		3.43	Strongly Agree
The use of ICT increases my motivation in teaching.		3.41	Strongly Agree
Overall, there is a positive impact of ICT in the emotional aspect.		3.40	Strongly Agree
Overall Mean Response	**Positive Statement** (1, 2, 3, 4, 5, 6, 7, 8, 9, and 10)	**3.33**	**Strongly Agree**

Legend: 1 – 1.75 (Strongly Disagree); 1.76 – 2.5 (Disagree); 2.51 – 3.25 (Agree); 3.26 – 4 (Strongly Agree)

The Table 4 shows the mean response of the respondents on Emotional Aspect. This shows that through the advent of technologies, the respondents were happy and satisfied to use these technologies in teaching. Because of this, they were responsive to the new and diverse perspectives in using the technology that they were confident and feel the excitement in imparting learning to their students. ICT has become an integral part of our daily living. Without these technologies life would be boring for the 21st century learners.

Table 5. Impact of ICT in the Respondents on Physical and Health Aspect

Statements		Response Mean	Interpretation
I manage time wisely in using technology to prevent eye strain.		3.18	Agree
I use to have a break time to take a rest in using technology.		3.25	Agree
With too much exposure to technology, I experience eye strain.		3.11	Agree
I experience back and neck pain due to bad sitting position in using the technology.		3.23	Agree
I experience a repetitive strain injury in wrists and hands due to long hours of using the technology.		2.84	Agree
I forget eating meals due to addiction in using the technology.		2.31	Disagree
I neglect personal hygiene because of Internet addiction.		1.78	Disagree
I have inadequate sleeping hours due to overnight usage of technology.		2.56	Agree
I lack proper exercise due to long hours of using the technology.		2.67	Agree
Overall, there is a positive impact of ICT in the physical and health aspect.		2.88	Agree
Overall Mean Response	**Positive Statement** (1, 2, and 10)	**3.10**	**Agree**
	Negative Statement (3, 4, 5, 6, 7, 8, and 9)	**2.64**	**Agree**

Legend: 1 – 1.75 (Strongly Disagree); 1.76 – 2.5 (Disagree); 2.51 – 3.25 (Agree); 3.26 – 4 (Strongly Agree)

The Table 5 shows the mean response on the impact of ICT in the respondents on Physical and Health Aspect. Based on the data, most of the respondents agreed in all positive statements and agreed with negative statement. The data shows a mean response of 3.18, the respondents agreed that they managed their time wisely in using the technology to prevent eyestrains where it was a common condition that occurred when the eyes get tired from the intense used such as staring at computer screens and other digital devices. It only went away once the eyes got rested or took other steps to reduce the eye discomfort.

Table 6. Relationship between the Subject Areas taught in Practice Teaching and the Impact of ICT on Emotional Aspect of the Respondents

Subject Areas	P – Value	REMARKS
Biology	0.0799	Not Significant
Carpentry	0.1378	Not Significant
English	0.4277	Not Significant
Mathematics	0.0033	Significant
Science	0.0902	Not Significant
Edukasyon sa Pagpapahalaga	0.4989	Not Significant
Edukasyong Pantahanan at Pangkabuhayan	0.6412	Not Significant
Music	0.5974	Not Significant
Arts	0.3956	Not Significant
Physical Education	0.5974	Not Significant

Health	0.3705	Not Significant
Chemistry	0.1888	Not Significant
Earth and Space	0.9032	Not Significant
Physics	0.4038	Not Significant
Drafting	0.3823	Not Significant
Technology and Livelihood Education	0.1338	Not Significant
Filipino	0.9032	Not Significant
Araling Panlipunan	0.6412	Not Significant
Geometry	0.3574	Not Significant

Level of Significance $\alpha = 0.05$.

$H_{03:}$ There is no significant relationship between the subject areas taught in practice teaching and the impact of ICT on emotional aspect of the respondents.

Table 6 above shows the results of Spearman's test for correlation. As can be observed, only the Mathematics subject has a p-value that is lesser than the level of significance. Thus, there is a significant relationship between Mathematics and the impact of ICT on emotional aspect of the pre-service teachers. While for the other subjects, it shows no significant relationship. The data implies that among the subject areas taught in practice teaching, Mathematics has a significant relationship on the impact of ICT on Emotional Aspect. Therefore the use of ICT materials has a serious and vital role to play to stimulate the teaching and learning of a given content area of Mathematics.

Table 7. Relationship Between the Gender of the Respondents and the Impact of ICT on Physical and Health Aspect

Gender versus Impact of ICT on Physical and Health Aspect					
Gender	**Strongly Disagree**	**Disagree**	**Agree**	**Strongly Agree**	**REMARKS**
Male	0	6	18	2	
Female	1	20	42	10	
P = 0.683					**Not Significant**

With a p-value 0.683 which is greater than the level of significance, resulted from a Chi-square test of association. This concludes that there is no significant relationship between the gender of the respondents and the impact of ICT on physical and health aspect. The data implies that there is no significant relationship between gender and impact of ICT on Physical and Health Aspect. This means, the result of the data mentioned, seems to have a limited research on gender issues in preservice teacher's impact of ICT especially on the Physical and Health Aspect.

Conclusion

It could be concluded that there was a positive impact of ICT on the following: teaching-learning process, social, behavioral, emotional, physical and health aspects. Also, pre-service teachers were able to use interactive tools in the classroom. There was also a social and behavioral aspect which had positive impact on the use of technology while interacting and communicating with others. On the emotional aspect, there was a positive impact to the new and the diverse perspective in using the technology and positive impact on

the physical and health aspect because pre-service teachers were able to manage time wisely in using technology.

Recommendations

The College of Education of MSU-IIT will establish strict policy guidelines for pre-service teachers' guide during practice teachings at the same time utilizing ICT in classrooms; Aspiring pre-service teachers to maintain and control the usage of ICT so that ICT will have a positive impact for them during their practice teaching.

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The Impact of Anti – Bullying Law among Elementary Students in North Central School

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Abstract

This study aims to determine the impact of Anti-bullying law to Elementary students. There were a total of 192 respondents and all of them are from five different sections in North Central School. The average ages of the respondents were 12 years old; most of them were males. Also most of the pupils have a religious of Roman Catholic.

The researchers found out that the respondents have a positive attitude towards bullying, which means that they do not want to bully or hurt others. It is also found out that females tend to bully other students than males, but there is no significant difference between the behavior of the students and their gender. Findings also show that there is no significant difference between the behavior of the students and their parents' occupation. The interview results have showed that the parents, teachers and the community have its role in the enforcement of the anti-bullying law.

The teacher, parents and community must continue to work cooperatively to lessen the cases of bullying in the school premises.

Keywords: *Anti-Bullying, attitude, parents*

Introduction

School is a place in which learning occurs. It is important to help create a school environment where all children feel safe and can learn to the best of their abilities. Over the years, many school problems arise. One of these is violence which threatens the learners' sense of security. More than any other school safety problem, bullying affects students' sense of security. Bullying is widespread and perhaps the most underreported safety problem on school campuses (Sampson, 2002).

According to Cebu Representative Gerald Gullas, Jr. (2015), a total of 6,363 cases of bullying in public as well as private elementary and high schools were recorded in 2014. Up to nearly 21 percent versus the 5,236 are documented in 2013. The figure does not include the unreported cases of students frightened to complain against being bullied in schools.

This common problem is being addressed by the institutionalization of Anti-bullying Law through Republic Act No. 10627, also known as the Anti-Bullying Act of 2013 which

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was signed into law by President Benigno Aquino III. This Act requires all Elementary and Secondary schools in the country to adapt policies to prevent and address the acts of bullying in their Institutions. From the day of its effectiveness up till now, does this Act change the situation in school? Does this prevent or in any case, lessen the act of bullying in schools? This study primarily aims to assess the impact of the Anti-Bullying Law in North Central School.

Statement of the Problem

This study seeks to answer the following queries:

1. What are the demographic profiles of respondents in terms of:
2. How does the anti-bullying law implemented?
3. Describe the impact of Anti-Bullying Law in terms of:
    a. School environment
    b. Student's behavior
    c. Student's sense of security
4. Describe the role of the following in the enforcement of Anti-Bullying Law and the prevention of bullying:
    a. Parents
    b. Teachers
    c. Community
5. Is there a significant difference between the behavior of the students and their gender?
6. Is there a significant difference between the behavior of the students and the occupation of their parents?

Review of Related Literature

According to Shahtahmasebi (2015), During the first decade of the millennium institutions along with a number of interested parties sought to engage the community in tackling bullying which involved approaching the media, politicians, Human Rights commission, and so on. There was very little interest shown in strategizing an action plan. Occasionally the media publishes an article or two highlighting the high rates of systematic bullying especially in school and in workplace.

It hasn't been until the latest violent and fatal high school shootings in American society that local communities, school administrators, teachers, parents, and students have begun to take zero tolerance policy and attitude towards bullies and bullying behaviors. Even though schools wide programs have been enacted, bullying behaviors are still prominent within our schools and unfortunately the numbers of incidences of school violence and shootings have increased (Baier, 2007).

In May 2012, the DepEd has directed schools to set up child protection committees to address bullying, discrimination, exploitation, violence and other forms of abuse. On the following year, the Anti – Bullying Law or Republic Act 10627 was enacted. The twin measures may have encouraged more victims to report cases of bullying and other forms of children abuses. But the thousands of recorded cases indicate that more efforts are needed to prevent bullying (The Philippines Star, 2015).

Research Design/Procedure

A mixed research design method was used in this study. A random sampling method is utilized to pick the respondents of the study. Grade six pupils are chosen as respondents since they are relatively knowledgeable in answering the given checklist related to the impact of anti-bullying. A draw lots was conducted for the selection of sections.

The result of the study was computed by the use of SPSS Student Version Software. The contingency coefficient is computed as the square root of chi-square divided by chi-square plus n, the sample size. The contingency coefficient value tells the strength of the relationship if there is a relationship between the variables.

Research Instruments Used

The following were the instruments methods used in the course of study.

1. Interview

A 6-item open ended interview questions was given to the guidance counsellor of the school. The interview questions are likewise checked and validated by the experts to ensure the appropriateness of questions in relation to the study. The interview with the guidance counsellor gave the needed information about the process of solving bullying in school in accordance with the anti-bullying law.

2. Anti-bullying Questionnaire

The researchers designed a 50-item survey questionnaire checklists composed of questions and statements in which the students are going to answer; these questionnaires were validated by experts. Also, to ensure each reliability, the Cronbach alpha was utilized in this study.

Findings/Analysis

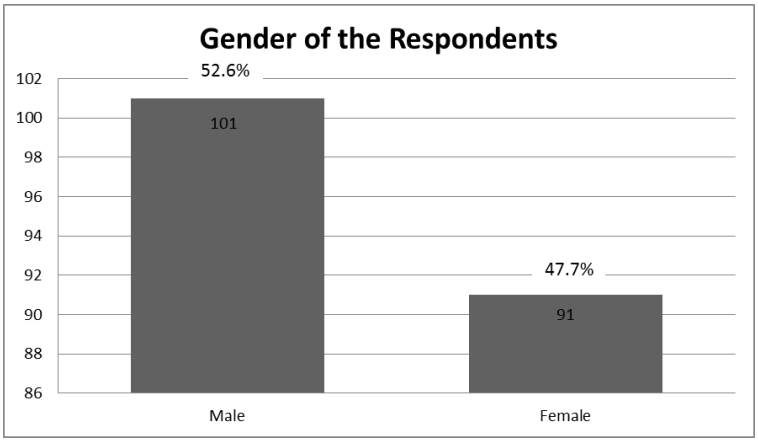

Figure 1. The Frequency in Terms of the Gender of the Respondents

The graph above shows the frequency in terms of the gender of the respondents. There are a total of 192 students who have answered the test questionnaire. 47.4% of them are girls and 52.6% of them are boys. This means that for this study, there are more male respondents than female.

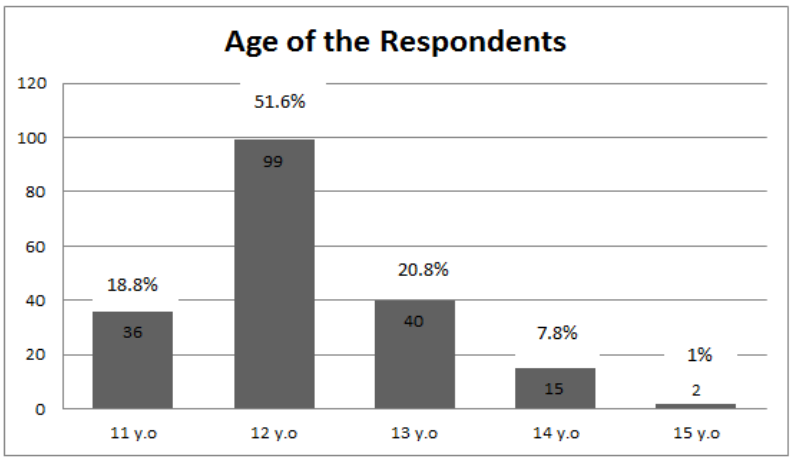

Figure 2. The Frequency in Terms of the Age of the Respondents

The graph above tells the age of the respondents involved in the study. It can be seen that most of the respondents belong to the 12 years of age. Though there are still 20.8% that have an age of 13, 18.8% have an age of 11, 7.8% have an older age of 14 and only one has an age of 15.

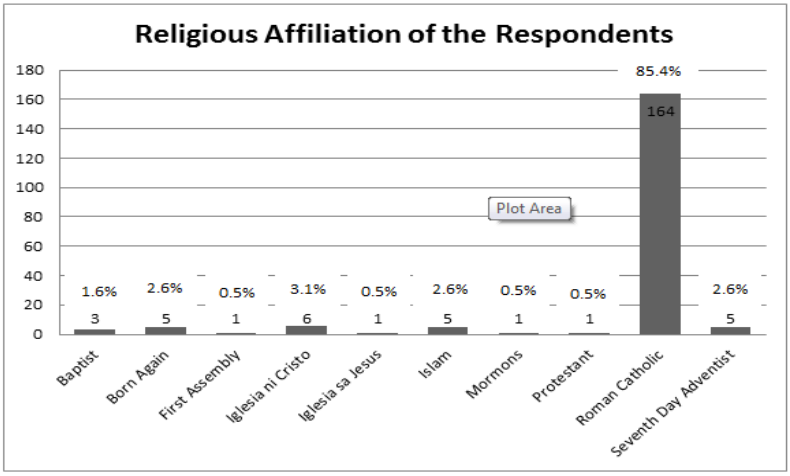

Figure 3. The Frequency in Terms of the Religious Affiliation of the Respondents

The graph above shows the different Religious Affiliations of the respondents. As it can be observed, 164 out of 192 are Roman Catholic. This means that most of them have the same religion.

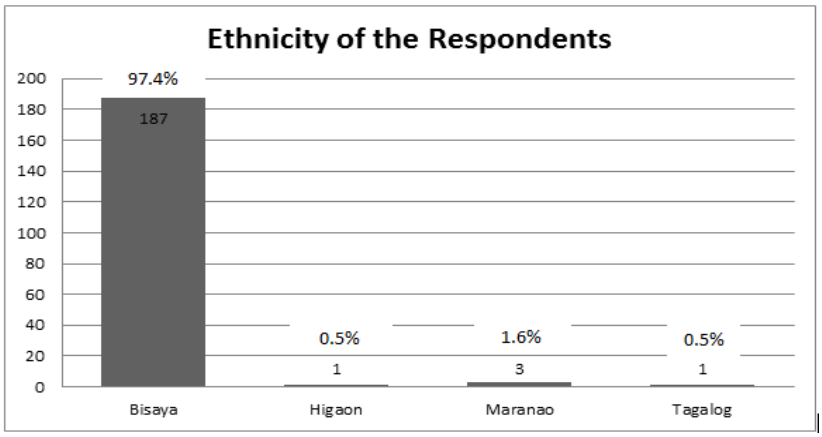

Figure 4. The Frequency in Terms of the Ethnicity of the Respondents

The ethnic affiliation of the respondents can be observed from the above graph. Most of the respondents according to the result are Bisaya.

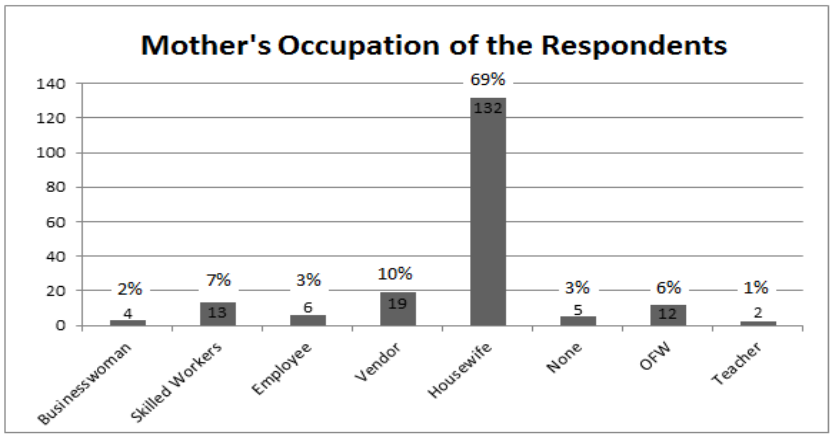

Figure 5. The Frequency in Terms of the Mother's Occupation of the Respondents

The graph and table above summarizes the Mother's Occupation of the Respondents. More than half of them answered that their mother are housewives. There are quite a few have mothers who are working to different fields such as skilled workers, OFW workers, businesswoman, vendors and others.

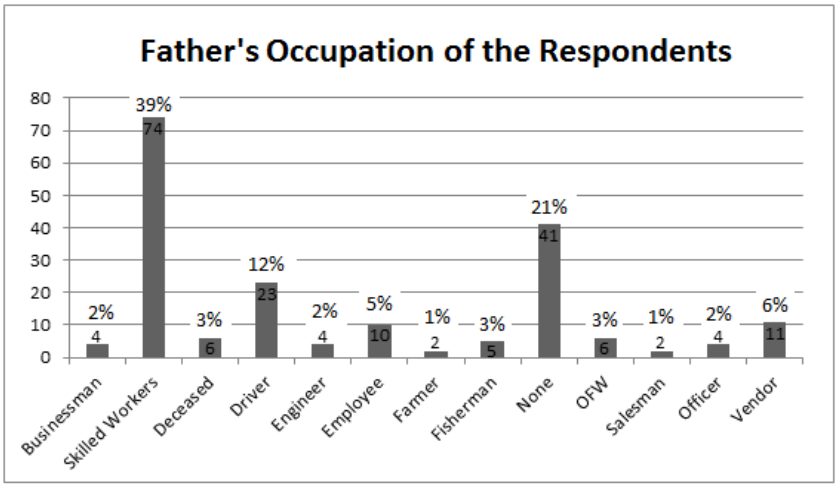

Figure 6. The Frequency in Terms of the Father's Occupation of the Respondents

The above graph shows the Father's occupation of the respondents. It is noted from the result that most of the father are skilled workers, followed by those unemployed.

Table 1. The Anti-bullying Law Implementation in School

Questions	**Average**	**Interpretation**
1. Do you know what is bullying and its negative impact to a person's life?	1.14	Yes
2. Are there any signage or poster around your school which discourage bullying?	1.60	Yes
3. Do you feel like the school takes bullying seriously?	1.89	Not Sure
4. Does your school hold seminar or lecture concerning bullying awareness and prevention?	1.5	Yes
5. Does your school respond to any bullying incidents happening in your school?	1.58	Yes
6. Does the office of the guidance perform its functioning properly (example: the guidance office is always open, the guidance office has personnel)?	1.30	Yes
7. Does your school provide counseling to bullies and the victim?	1.58	Yes
8. Does your school encourage you to report bullying happening at school?	1.32	Yes
9. Are there any school personnel in your school	1.52	Yes

(example: security guard, janitor, school officers) who survey the school for any school problems (example: cutting classes, fighting, etc.)?		
10. Are you aware that your school adopts the anti-bullying law?	1.64	Yes
Overall Average:	**1.51**	**Yes**

The table above shows the anti-bullying implementation questions with the average corresponding response of each item. The overall average response of the students is "YES". This means that on the average, the students agreed to the statements about the implementation of anti-bullying law in their school. It implies that they are aware that this certain law is functioning well in their learning environment.

Table 2. The Impact of Anti-bullying Law in the School Environment

School Environment	**Average**	**Interpretation**
1. The teachers and other school personnel are respected in our school.	4.42	Strongly Agree
2. Smoking is not allowed in our school.	3.95	Agree
3. Vandalism is not allowed in our school.	3.74	Agree
4. Students of different ethnicity are treated equally in our school.	3.95	Agree
5. Sexual harassment is not a problem in our school.	2.17	Disagree
6. Bringing of alcoholic drinks (example: beer, tanduay, etc.) is prohibited in our school.	2.14	Disagree
Students Behavior	**Average**	**Interpretation**
7. Gays and lesbians are treated equally in our school.	3.44	Agree
8. Differences in Religion and ethnicity are not a problem in our school.	3.94	Agree
9. There is a peaceful relationship between students, teacher, and staff in our school.	4.12	Agree
10. The existing environment of my school discourages bullying.	3.20	Neutral
Overall Average:	**3.51**	**Agree**

The table above shows the average response of the students on the impact of anti-bullying law on the schools environment. On the overall average, the students "AGREED" to the statements in the questionnaire. It implies that the school environment have a positive climate. It shows that since the school observes the implementation of the anti-bullying law, their school environment also had a positive atmosphere towards every members of the school.

Table 3. The Impact of Anti-bullying Law on Student's Behavior

Students Behavior	**Average**	**Interpretation**
1. I make fun of others when they made a mistake.	2.56	Disagree
2. I feel superior/powerful to other people.	2.74	Neutral
3. I'm amused by seeing other people being bullied.	2.41	Disagree
4. I use bad words when talking.	1.89	Disagree

5. I humiliate others either in public or other places.	2.43	Disagree
6. I want to harm others.	2.20	Disagree
7. I use harsh words (example: bu-ang, bugo, etc.) when talking to someone.	2.03	Disagree
8. I often get into fights.	1.98	Disagree
9. I want to be feared and instill fear to others.	2.66	Neutral
10. I feel good when i make people cry.	2.10	Disagree
11. I belittle the ability of other people.	2.59	Disagree
12. I make fun of others who are in different religion or ethnicity other than mine.	2.70	Neutral
13. I make fun of practices of other people (example: e.g. praying before eating, Muslims doing their prayer, etc.).	2.92	Neutral
14. I want to compete with other student.	3.05	Neutral
15. I act tough so no one bully me.	3.11	Neutral
16. It's better to bully others than being bullied.	2.19	Disagree
17. I often pick/tease disabled person.	2.49	Disagree
18. I'm afraid of reporting bullying incidents in school.	2.76	Neutral
19. I ignore when I see someone gets bullied.	2.43	Disagree
20. I never felt sorry after bullying someone.	2.45	Disagree
Overall Average:	**2.49**	**Disagree**

The overall average response of the students to the statements on the impact of anti-bullying law to their behavior is "DISAGREE". It shows that most of the students did not agree to bully other students. This result corresponds also to the previous results of this study.

Table 4. The Impact of Anti-bullying Law on Student's Sense of Security

Students Sense of Security	**Average**	**Interpretation**
1. I saw students bringing weapons in school (example: knife, ice pick, etc.).	2.02	Disagree
2. There are a lot of formed groups/gangs/fraternities in our school.	2.08	Disagree
3. Students in our school are involved in gang wars with other schools.	2.10	Disagree
4. Our bags are not checked for any prohibited things before going inside the school.	2.59	Disagree
5. My school is safe.	4.06	Agree
6. I have not seen violence inside the school.	3.20	Neutral
7. There are few cases of bullying in our school.	2.99	Neutral
8. The school takes appropriate measures in solving bullying.	3.36	Neutral
9. Students obey the school's rules and regulations.	3.80	Agree
10. The growth of violence in our school is alarming.	3.16	Neutral
Overall Average:	**2.94**	**Neutral**

The overall average response is "NEUTRAL". This implies that students do not feel threatened by their school climate. This result agreed also to the previous result of the study which means that the anti-bullying law secures the students feeling of safeness in going to school.

Table 5. The Role of Parents, Teachers, and Community on the Enforcement of Anti-bullying Law

Parents	They are the role model to each child. They should know on how to inculcate good moral values to their children.
Teachers	They are the second parent in school. Each of them is liable of every pupil they have in school. As teachers, they must know how to mold the young minds of every learner in school more specifically the moral values among students.
Community	A better place to live if and only if, the people in the community is united and possess good moral values. The community is one factor that can contribute to the development of a child. It is in the society where the child can get socialization from peers, so as a parent you must be vigilant enough to know the friends of your child in your community.

An interview with the guidance counselor is conducted to determine the role of the parents, teachers, and community in the enforcement of Anti-Bullying Law and the prevention of bullying. The table in the previous page summarizes the answer.

According to Schargel (2014), parents should talk to their child about what happened in school. Connecting with the school head or a faculty member can be a great help especially those who are knowledgeable in dealing with bullying. Bullies should be confronted in private. Challenging bullies in front of their peers may actually enhance their status and lead to further aggression. The parents of both victims and bullies should be notified when confrontations occur, and seek to resolve the problem expeditiously at school.

In the Implementing Rules and Regulations of Republic Act No. 10627 (2013), it is said that the teachers and other school personnel shall participate and cooperate in all prevention, intervention and other measures related to bullying. Teachers are supposed to know more about bullying in order for them to be able to know what are the right measures to do in preventing cases of bullying.

Dr. Becki Cohn-Vargas (2015) said that communities – including families, schools, law enforcement, and others – can work together to prevent and address bullying. Together they can serve as role models to educate; listen, encourage, and to strengthen students who have been bullied. Also to empower bystanders to act and help those who bully others to behave appropriately and kindly.

Table 6. The Relationship between the Behavior of the Students on their Gender

	Male	Female	Total	Result	Interpretation
Strongly Agree	20	21	41	*Contingency Coefficient P-value = 0.190	There is no significant difference between the behavior of the students and their gender.
Agree	28	35	63		
Neutral	37	29	66		
Disagree	15	6	21		
Strongly Disagree	1	0	1		
Total	101	91	192		

Most of the male respondents said that they are neutral to the statements about bullying others. However, on the other hand, most girls said that they agree to the statements about bullying others. This means that most of the girl respondents have bullied other

students in the past or even in the present. According to Leach (2006), a research suggests that girls are adopting increasingly sophisticated methods of bullying - taunting, alienating and using SMS and instant messaging as forms of social intimidation. This could be supported today since the advancement of technology like using social media is the trend of the "millennial".

Though girls tend to bully others more than boys, there is still not enough evidence to conclude that there is a relationship between the behavior of the students to their gender. The result of the contingency coefficient p-value is 0.190. This is greater than the level of significance which is $\alpha = 0.05$. This means that the null hypothesis is not rejected. Hence, there is strong evidence that there is no significant relationship between the behavior of the students and their gender.

Table 7. The Relationship between the Behavior of the Students and their Mother's Occupation

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total	Result	Interpretation
Businesswoman	0	1	2	0	0	3	*Contingency Coefficient p-value = 0.896	There is no significant relationship between the occupation of the mother and the behavior of the students.
Skilled Workers	2	5	6	0	0	13		
Employee	2	3	0	1	0	6		
Vendor	6	7	3	3	0	19		
Housewife	32	47	32	20	1	132		
None	3	0	2	0	0	5		
OFW	3	5	2	2	0	12		
Teacher	0	1	1	0	0	2		
Total	48	69	48	26	1	192		

Note that the contingency coefficient p-value is 0.917 and it is greater than the level of significance which is 0.05. This means that the null hypothesis is not rejected. Thus, it can be concluded that there is no significant relationship between the occupation of the mother and the behavior of the students. This just implies that the occupation of their mother dies not affect their behavior towards bullying.

Table 8. The Relationship between the Behavior of the Students and their Father's Occupation

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total	Result	Interpretation
Businessman	1	1	2	0	0	4	*Contingency Coefficient p-value = 0.776	There is no significant relationship between the occupation of the student's
Skilled Workers	19	24	18	13	0	74		
Deceased	0	3	3	0	0	6		
Driver	5	10	5	2	1	23		
Engineer	0	2	2	0	0	4		
Employee	3	1	2	4	0	10		

Farmer	0	1	1	0	0	2		father and their behavior.
Fisherman	2	2	1	0	0	5		
None	11	13	9	8	0	41		
OFW	2	4	0	0	0	6		
Salesman	0	1	1	0	0	2		
Officer	1	1	2	0	0	4		
Vendor	4	6	1	0	0	11		
Total	48	69	47	27	1	192		

The result above shows a contingency coefficient value that is greater than 0.05. This means that the null hypothesis is again not rejected. Therefore, there is strong evidence that there is no significant relationship between the occupations of the student's father versus their behavior. This means that the job of their father does not affect their behavior towards bullying.

Conclusion

1. The school implemented the Anti-Bullying Law in their learning environment.
2. The school has positive climates which promote harmonious relationship between, students, teachers, and other school staff.
3. The respondents have a positive attitude towards bullying which means that they do not want to bully or hurt others.
4. Females tend to bully other students in the past or until the present than males.
5. The parents, teachers and the community has its role in the enforcement of the anti-bullying law. Each of them must cooperate to maintain a bullying free society.
6. There is no significant difference between the behavior of the students and their gender.
7. There is no significant difference between the behavior of the students and their parents' occupation.

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Classroom Management for Students with Autism Spectrum in Inclusive School

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Abstract

The aim of this research were to describe the classroom management for students with autism spectrum in the Inclusive Elementary School Ketintang II/410 Surabaya, to describe the factors supporting and factor inhibiting the implementation of the classroom management for students with autism spectrum in the Inclusive Elementary School Ketintang II / 410 Surabaya. This research used qualitative research method with qualitative descriptive study self-report. The data was collected through observation, interview toward nine informants, and documentation. The data obtained was then analyzed by the analysis model by Miles, Huberman, and Saldana involving: data condensation, data display, conclusion drawing and verification. The research results showed: the classroom management aspects of managing students is 73% implemented well, the classroom management aspects of managing the physical condition of class is 67% implemented well, while classroom management aspects of specialty development program was 25% implemented well, which only the evaluation that has been applied well, while the assessment, planning and implementation of specialty development program were not applied yet. So it could be concluded that classroom management aspects of managing students and aspects of managing the physical condition of Inclusive Elementary School Ketintang II/410 Surabaya has been implemented well, while the classroom management aspects of specialty development program was not implemented well. The factors supporting classroom management for students with autism spectrum on the Inclusive Elementary School Ketintang II / 410 consists of factors: physical environment, socio – emotional conditions and organizational conditions. Further, factors inhibiting classroom management also consists of factors: physical environment, socio – emotional condition and organizational conditions.

Keywords: *Autism Spectrum, Clasroom Management, Inclusive School*

Introduction

Education is an important thing that must be developed from birth to the end of life. Further, education is a human right, and the right of all citizens. Education is also useful for developing the potential of individuals in the face of future challenges and has existed since humans existed, although in practice it is still very simple (Roesminingsih and Susarno, 2011: 51). Education in Indonesia is guaranteed juridically, where all citizens are entitled to education, not to mention children with special needs.

Children with special needs can simply be interpreted with children who have impirments that require special services different than other children. According to WHO calculations is estimated to be 10% of all Indonesians (24 million citizens) experiencing special needs (ILO, 2014: 2), with an increasing number each year. As for children with autism spectrum has the highest trend compared to other conditions of special needs.

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BPS (Indonesia's Bureau of Statistics) estimates that from 2010 to 2016 there are about 140,000 children under the age of 17 who bear the autism spectrum (Kurnia, 2015). Similar data was presented by the Director of Bina Jiwa Indonesia's Ministry of Health in 2013 which estimates that there are children with autism spectrum of 112,000 with the age range from 5-19 years (Priherdityo, 2016). Further, the research and consultancy organization, SPIRE estimates there are 139,000 people with autism spectrum of 400,000 children with special needs (Kurnia, 2015).

Conditions experienced by autism spectrum children have implications for the need for specialized educational services. In Indonesia under the Strategic Plan of the Ministry of National Education Year 2005, education for children with special needs including children with autism spectrum can be obtained through two available educational services including: special school education services, and inclusive school education services. Furthermore, students with autism spectrum in practice are more emphasized for obtaining inclusive education services (Ormrod in Koegel, et al., 2011: 7) unless the special needs condition is severe enough and requires special treatment. This is in line with Indonesia's Ministry of Education Regulation Number 70 Year 2009 which states that inclusive education is for students who have abnormalities and have the potential of special intelligence / talent through inclusion schools in each region.

The learning process basically consists of two important processes namely the process of teaching and classroo, management (Sunhaji, 2014: 36). In addition to the teaching process, the process of classroom management is crucial to be applied by teachers. Classroom management is also able to maximize student learning opportunities (Charles, 2002; Evertson, et al., 2003, in Santrock, 2015: 553).Previous research by Goodenow & Wenzel (in Mansor, et al., 2012: 37) suggests that the attachment of students to the school because good classroom management can have a positive impact on academic motivation, understanding ability, and good emotional development in students. It is well known that in every class there must be problems or disturbances that arise when learning takes place. This is in line with the opinion of LaCaze, et al (2012: 2) which reveals that all classes must have problems and it is important for teachers to immediately address the problem. Furthermore, Witcher and Minnor (in Mansor, et al., 2012: 36) include classroom management skills in 6 characteristics teachers must possess effectively.

Classroom management as a teacher's effort in order to organize and implement classroom learning effectively and efficiently should also be applied to students with an autism spectrum in inclusive schools. The purpose of effective and efficient management classroom that is the implementation of aspects of classroom management in accordance with the characteristics of students with autistic spectrum.

One of the inclusive schools that provide educational services for students with autism spectrum is Inclusive Elementary School Ketintang II / 410 Surabaya. Based on the results of preliminary observations, this school has been conducting inclusive education since the academic year 2009-2010 with the number of students with autism spectrum is quite a lot and spread in class I, II, IV, V, and VI. The preliminary observation of classroom management for students with autism spectrum in Inclusive Elementary School Ketintang II / 410 Surabaya showed contradictory results. Based on the observations, students with autism spectrum are able to interact and cooperate with other students, this certainly indicates good classroom management. On the other hand, the learning outcomes of students with the autism spectrum are still far below the stated goals, this can be said to be an indication of poor classroom management. So the classroom management in Inclusive Elementary School Ketintang II / 410 Surabaya need for immediate further investigation. So the aim of this research were to describe the classroom management for students with autism spectrum in the

Inclusive Elementary School Ketintang II / 410 Surabaya, to describe the factors supporting and factors inhibiting the implementation of the classroom management for students with autism spectrum in the Inclusive Elementary School Ketintang II / 410 Surabaya.

Literature Review

The autism spectrum is the most recent term used to describe children who experience obstacles in social communication and behavior due to neurological disorders (replacing autistic and autism). This term has been used in the DSM-5 (Diagnostic and Statistical Manual of Mental Disorders Fifth Edition) since 2013. The use of the term spectrum illustrates that the constraints and needs of children with autism spectrum stretch differently from one another.

The autism is a complex neurobiology development disorder that occurs during the lifetime of individuals, as well as having problems in social interaction and communication, they also often do a thing repeatedly (Gargiulo, 2012: 324). Meanwhile, according to Peeters (2009: 6), autism is a developmental / pervasive barrier and not a form of mental illness. According to Power (in Mudjito et al., 2011: 40) there are six disorders experienced by students with autism spectrum include: interaction disorders, communication disorders (speech and language), play disruptions, sensory disturbances, emotional and emotional disturbances , As well as behavioral disorders.

Furthermore, in addition to the complexity and individuality of the barriers experienced by stduents with the autism spectrum, Hermanto (2010: 80) explains that classroom management is important for students with special needs in order to learn comfortably otherwise a less structured class can lead to undesirable behaviors (Glazzard, et al., 2016: 118). Classroom management for students with special needs is set out in the Indonesia's General Guidelines for the Implementation of Inclusive Education (2011: 41-42) although not in detail, where inclusive classroom management consists of full regular classes, regular classes with special education teachers, as well as special classes .

Aspects in classroom management vary considerably between experts, and so far no general agreement has been reached regarding important aspects of classroom management. In general, however, the aspects of classroom management consist of: aspects of the student's management/ emotional state (including: behavior, discipline, interest / interest, passion, and group dynamics) and physical condition management (including: ventilation, lighting, comfort, location of sitting, and placement of students) (Karwati and Priansa, 2014: 24). Specifically, each of these aspects is not explained in more detail, thus requiring another expert's perspective on classroom management aspects.

Santrock (2015) divides aspects of classroom management into several aspects including: designing the classroom physical environment, creating a positive environment for learning, applying classroom rules and procedures, teacher interaction with students, and applying reward and punishment policies.

So for this research, aspects of classroom management to be studied is a combination of aspects of class management proposed Karwati and Priansa (2014) with aspects of classroom management proposed Santrock (2015), as well as the addition of aspects of the program development of specificity for students with autism spectrum. Merging done with Still divides the aspects of classroom management into two aspects: the students management, and the management of the classroom physical condition, with the aspect of setting the students subdivided into sub aspects which include: creating a positive environment for learning, applying the rules and procedures of learning in the classroom, teacher interaction with Students, and the application of reward and punishment policies. While the physical condition setting asek class includes: infrastructure, visibility, accessibility, flexibility, comfort, and beauty. Also the aspect of specialty development program. This program is

given for students with autism spectrum is an attempt to develop interaction, communication, and behavior of students with autism spectrum, through an ongoing process which consists of: assessment, planning, implementation, and assessment (Indonesia's Ministry of Education and Culture, 2014: 4).

Design/Procedure

This research used qualitative approach, with the type of research is descriptive. The study was conducted in Inclusive Elementary Schools Ketintang II / 410 Surabaya City, East Java Province, Indonesia. This school was selected because of the number students with autism spectrum is quite numerous and diverse, and spans from the grade I, grade II, grade IV, grade V, and grade VI. Furthermore, this school has been implemented inclusive education for more than six years. Aspects studied in clasrrom management including : managing students, managing physical condition of class, and managing specialty development program. Coupled with factors that support and inhibit the implementation of clasroom management for autism spectrum students. The research conducted for one month starting on February 2017 until March 2017. This research studied classes ranging from grade I to grade VI, except grade III.

The research process starts from the preparation (research permit, and set for schedule), data collection, data analysis, conclusion and suggestion drawing. Data collection techniques used is through the observation, interview, and documentation. Non-participant observation was implemented during the learning over two times in grade I, grade II, grade IV, grade V, and grade VI using observation instruments. Interview was conducted in-depth with key informants as many as eleven people include: principal, classroom teachers from grade I, grade II, grade IV, grade V, and grade VI , as well as a special education teachers from grade grade I, grade II, grade IV, grade V, and grade VI. The interview use open structured instruments.

The research design is shown in Figure 1. The design including: preeliminary study, data collection process, data analysis, data validation, analysis data after validation, conclusion drawing and suggestion. The data was analyzed with Miles, Huberman, and Saldana model (2014), which includes the process of: condensing the data (merging and strengthening data), data presentation, conclusion drawing and verification.

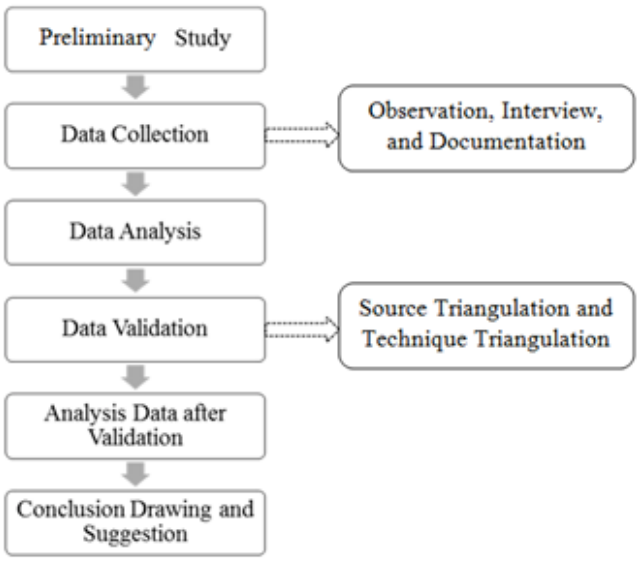

Figure 1. Research Design

Data was validated by the use of triangulation. Triangulation type used is source triangulation and technique triangulation. Source triangulation is done through asking the same question to different informant to get valid data. Technique triangulation was done by comparing data of interview, observation, and documentation.

Findings/Analysis

1. Classroom Management Aspect of Managing Students

In general aspects of managing students already goes pretty well. This can be seen from four sub-aspects, which are further divided into 11 indicators, only 3 indicators (application of learning rules, application of learning procedures, and handling of problematic behavior) that have not gone well. It can be concluded 73% of the classroom management aspects managing students, has been running well. In detail in terms of developing a positive environment for learning, all classroom teachers and special education teachers, unless the classroom teacher and special education teachers in grade IV has adopted the right approach and style of classroom management that is a social emotional approach where teachers build good relationships with autism spectrum students, through direct interaction and individual guidance. This approach as recommended by: Koegel, et al., 2011: 5; Tabb, et al., 2013: 58; Gargiulo, 2012: 342. Most teachers still can not apply one implementation of the principles of the rules and procedures in the classroom that prepare students if there is a change as described by Kerr, et al., 2007: 20; Glazzard, et al., 2016: 1, even though this important principle, to prevent students with autism spectrum overreact to changes in the rules. In terms of interaction with students with the autism spectrum, all teachers are able to interact in speaking, listening, and non verbal, while in writing is not applied, as for classroom teachers and special education teachers in grade IV is still less intense in social interaction with students with autism spectrum. In terms of dealing with problematic behaviors most teachers have not been able to properly implement minor interventions. Further implementation of award and punishment policies is appropriate, although some teachers such as special education teachers in grade II and grade IV have not implemented a reward policy.

2. Classroom Management Aspect of Managing the Physical Condition

In general, management of classroom physical condition in Inclusive Elementary School Ketintang II / 410 Surabaya is good enough. This can be seen from six sub-aspects, divided into 9 indicators, only 3 indicators (facilities and infrastructure in the regular classroom, facilities and infrastructure in special class, and classroom beauty) that have not gone well. Can be concluded 67% classroom management aspects of the managing physical conditions are running well. In detail the visibility, accessibility, flexibility, and comfort (lighting, airing, acoustics, and density) are good enough. While the beauty, for the regular class is quite beautiful and neat, while the special class is still less orderly and cause distraction. Though the class need to neatly, especially the students bench, so that students with autism spectrum able to concentrate well (Kerr, et al., 2007: 25).

3.Classroom Management Aspect of Specialty Development Program

In general, classroom management aspect of of specialty development program for students with autism spectrum in Inclusive Elementary School Ketintang II / 410 Surabaya is still not good. It can be seen from four sub aspect, only one sub aspect that is already good appraisal, or it can be said classroom management aspect of specialty development program only goes well 25%. In the case of the assessment of many documents that can not be traced, even with the program plan. Further, implementation of the specialty development program

also has not done particularly with regard to four key competencies that should be developed for students with autism spectrum, whereas the core competencies is important for students autism spectrum, and should be done individually (Charman, et al., (2011 : 44). Moreover the evaluation is already comprehensive because it covers aspects of attitudes, knowledge, and skills. Further inclusive report card also described the development of the behavior of students with autism spectrum divided into aspects: discipline, responsibility, and participation in learning.

4. Supporting Factors in the Implementation of Classroom Management for Autism Spectrum Students

Supporting factors of classroom management for students with autism spectrum in Inclusive Elemetary School Ketintang II / 410 Surabaya including: physical environment, socio-emotional condition, and organizational conditions. The physical environment includes the availability of adequate facilities and infrastructure, and good classroom physical arrangements. The socio-emotional conditions include positive support from various people, the understanding of the school's members regarding the autism spectrum. While the organizational factors is good acceptance of regular students and other teachers to students with autism spectrum.

5. Inhibiting Factors in the Implementation of Classroom Management for Autism Spectrum Students

Inhibiting factors of classroom management for students with autism spectrum in Inclusive Elementary School Ketintang II / 410 Surabaya including: physical environment, socio-emotional condition, and organizational conditions. Physical environment is unavailability of media for students with autism spectrum, unavailability of stimulus room, as well as the beauty of a special room. The socio-emotional conditions include the implementation of the principles of application of rules and procedures of learning and the principle of handling problematic behavior that is less precise, and the limited social interaction of grade IV classroom and special education teachers. While the organizational conditions including the limited knowledge of teachers and the number of students with special needs handled.

Recommendation

Recommendations given are:

1. For school principals should provide special training program for classrrom teachers and special education teachers about the implementation of classroom management for students with autism spectrum.
2. Classroom teachers and special education teachers can develop competencies in classroom management for students with autism spectrum through discussion, and training.
3. Parents and the school members can be open minded and supportive toward friendly and convenient learning for students with autism spectrum.
4. Further research should be done regarding more specific aspect in the implementation of classroom management for autism spectrum students both in inclusive school and in special school.

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The Effect of Natural surrounding Exploration Approach towards Learning Outcomes of Natural Sciences for Students with Intellectual Disability

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Abstract .
Students with intellectual disability that require specialized learning can improve learning outcomes by using a natural science approach Neighborhood Nature Exploration. The purpose of this study was to determine the effect of natural surrounding exploration approach towards Learning outcomes of natural sciences for students with intellectual disability. The study used research designs Pre experimental design to form one group pretest-posttest design. Subjects of this study is 8 students tungrahita class II. The collection of data by providing pretest, treatment and post-test. Data analysis used ladder - Wilcoxon signed. Hypothesis test results showed that the value Thitung (36)> Ttabel (6), then Ho is rejected. The conclusion was that there are significant effect of natural surrounding exploration approach towards Learning outcomes of natural sciences for students with intellectual disability

Keywords: *Nature Roaming Around Approach, Natural Sciences, Intellectual Disability*

Introduction

Children with special needs have broader meanings, that is children who have developmental barriers and learning barriers including children with disabilities. According to Santoso (2012: 1) the term Children with Special Needs does not mean replacing the term of children with disabilities or special children but contains a wider and more positive perspective on students or children who have diverse needs. Children with special needs require special services in education, so that learning barriers can be eliminated so that their needs can be met. The world of education in Indonesia has paid attention to the educational needs of children with special needs. This is evidenced by the number of Special Schools established in Indonesia, especially in East Java.

Based on The Law No. 20 (2003), on the National Education System Article 32 states that: "special education is an education for learners who have difficulty in following the learning process because of physical, emotional, mental, social and also have potential intelligence or special talent ". The data obtained by the number of Special Schools in East Java is 205 schools. One type of Special School is the SLB C (Indonesia's term whih is mean Special School for Mental Retardation Students), an special school for students with mental retardation or commonly referred to as children with mental retardation.

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Education for mental retardation students is no different from primary school students education in general. There are some subjects, one of them is Natural Science. Based on the standart of competence of Special Elementay School, one of the competency standards that must be mastered by second grade students in Natural Science subjects is living creatures and life processes. In that standart of competence there are four basic competencies, one of which is to know the main parts of animals and plants around the house and school through observation. Based on the results of interviews with one of the teachers of SDLB B-C (Indonesia's term for Special Elementary School for Hearing Impairment and Mental Retardation Students) Kepanjen Malang City, the atmosphere of learning that took place in the class still adheres to the old paradigm, the teacher has not used various methods and innovative learning models. Teachings presented by teachers are still very monotonous, boring and unable to generate student motivation to learn. Learning activities that empower the capabilities that students already have not been maximally implemented.

The learning process presents significant challenges for the mental retardation students. The students are slower in learning and generally experience difficulties in the areas of: (1) attention, (2) thought processing, (3) memory, (4) generalization, (5) perception, (6) adaptive behavioral skills (Wijaya, 2013 : 38). Teachers need to make adjustments to how to teach tunagrahita tudents especially in Natural Science subjects. For example, to be able to overcome the lack of ability to recall in the tunagrahita students, teachers can build opportunities so that students can often gain experience learning new skills or knowledge (Wijaya, 2013: 40-41). Tunagrahita students may also have difficulty making meaning out of what has been felt (eg interpreting images), to overcome this, teacher should provide visual support using real-life examples such as the real situation (Wijaya, 2013: 42-43). One method to improve the learning outcomes of is the approach of Surrounding Environment Exploration (SEE).

The Approach of Surrounding Environment Exploration is chosen because by exploring the natural surroundings, students can see directly the living things to make it easier to understand and remember the main parts of living things, especially the animals that are around. According to Mulyani (2010), Surrounding Environment Exploration (SEE) is a concept of learning that connects with real situations and encourages learners to make connections between the knowledge they have and the implementation on their lives as members of the community.

Surrounding Environment Exploration can build meaning or can involve more senses including sense of sight, the sense of hearing, the sense of touch, and the sense of smell in the students and provide a more memorable experience. This approach can provide immediate experience to students to be more familiar with the natural environment. In addition, this approach can be one of the learning alternatives to prevent students from monotonous learning boredom. Surrounding Environment Exploration which in the process will invite students to observe nature around the school fits very well with the characteristics of science that require active learning and scientific discovery. It is expected that the use of Surrounding Environment Exploration can improve students learning outcomes. Then this research aim to (1) descibe the effectiveness of Surrounding Environment Exploration Approach toward Natural Science learning outcomes of second grade mental retardation students in SDLB B-C Kepanjen Malang City (2) descibe the effect of Surrounding Environment Exploration Approach toward Natural Science learning outcomes of second grade mental retardation students in SDLB B-C Kepanjen Malang City

Literature Review

According to Sukotjo & Triarini (2015: 1), mental retardation child is a child who has limited ability in thinking or using his reason. Each mental retardation child has different characteristics in accordance with the IQ owned by them. The classification of children with mental retardation is: (1) mild mental retardation with IQ between 55-70, (2) moderate mental retardation with IQ between 40-55, (3) severe mental retardation IQ between 25-40, (4) profound mental retardation IQ below 25 (Sukotjo & Triarini, 2015: 1). From some classification of children with mental retardation, the researchers focused on the child with mild mental retardation.

Mild mental retardation children are mental retardation children who still have the ability to study in school. The intellectual ability of the mental retardation children to think, to predict, and to and evaluate is very limited, so to develop ideas and to construct the idea is very limited. This is evidenced by the low learning outcomes of children with mental retardation. Learning according to cognitive view is a process that expresses the capacity to uphold as behavior. The learning process occurs, among others, covers the stimulus settings received and adapt it to the cognitive structure that has been owned and formed in the mind of a person based on experience and previous understandings. Learning outcomes are the reference of the pre-defined learning prior to setting the learning method. Learning outcomes can make it the basis for subsequent treatment (Yamin, 2013: 242). The learning outcomes to be measured by the test should be in accordance with the learning objectives, to see the achievement of the learning that has been done.

Natural Science learning is a very fun learning that can be implemented with various models, methods, and media that is atract students to learn something that exists in the environment. Teachers can create an active, innovative, creative, effective, and fun learning environment. Many solutions that can be done to improve student learning outcomes in Natural Science subjects, among others, is to carry out outdoor learning such as utilizing nature around the school. Learning with the surrounding environment exploration model will make students happy and feel more refreshed. The learning process of the Surrounding Environment Exploration approach is more centered on student activeness, more social, more use of multi resources and assessment. Surrounding Environment Exploration comprehensively integrating various approaches include exploration and investigation, constructivist, skills of processing with cooperative learning. The components of the surrounding environment exploration, namely: exploration, constructivist, the process of science, community learning and edutainment.

Method

The research design used is *Pre Experimental Design* with type of *one group pretest-posttest design.* The data were collected by doing a a pretest, treatment and post-test. The subjects were all students in second grade mental retardation students in SDLB B - C Kepanjen Malang City, amounting to 8 students. The instrument used was an objective test used to assess learning outcomes. Analysis of data using hierarchical test - Wilcoxon marked

Findings / Analysis

This research was conducted to all second grade mental retardation students in SDLB B-C Kepanjen Malang Regency which amounted to 8 students. The research result of 8 students are explained bellow.

1. Data of Natural Science Learning Outcomes Before Implementing Surrounding Environment Exploration

At the time of implementation of pre test on second grade mental retardation students in SDLB B-C Kepanjen Malang Regency. Pre-test activities conducted for four times as the aim to know the stability of the students. Implementation of pre test was conducted on March 7, 2016. This pre test aims to know the students' initial ability about the material to be given before using the approach of the surrounding nature about "Know the Main Parts of Animal Body".

During the pre test activity students look confused and less confident in working on the pre-test. Students are used to working on test with the help of classroom teachers. Therefore, when did the pre test they were just looked at the questions. When approached by researchers students even asked about the answer to the questions. After that, researchers only direct the way to do the questions and provide the motivation for confidence. The pre-test value of second grade mental retardation students in SDLB B-C Kepanjen can be seen in table 1 bellow :

Table 1 : Pre Test Value

No	Name	Pre Test Results
1	Al	30
2	Az	30
3	Bl	10
4	Dw	30
5	Hq	60
6	Ns	50
7	Rz	40
8	Yg	50
Average		37.5

From the table above it can be concluded students who scored more than Minimum Criteria of Mastery Learning at 60 is as much as one and that got score less than Minimum Criteria of Mastery Learning is 7. While the average value of all the students is 37.5.

2. Data of Natural Science Learning Outcomes After Implementing Surrounding Environment Exploration Approach

To know the results of the four days treatments from March 8 to March 11 so it is conducted a post test for once. Post test is done after treatment is done. The post test value of mental retardation students at second grade SDLB B-C Kepanjen Malang City can be seen in table 2 bellow.

Table 2 : Post Test Value

No	Name	Post Test Results
1	Al	80
2	Az	70
3	Bl	70
4	Dw	80
5	Hq	90
6	Ns	80
7	Rz	80
8	Yg	80
Average		78.75

From the table above it can be concluded the results of the post test, students who scored more than Minimum Criteria of Mastery Learning at 60 is as much as eight and got the score less than Minimum Criteria of Mastery Learning is zero. With the average value of all the students 78.75. Hypothesis test is used to know the Differences of Surrounding Environment Exploration (SEE) toward Natural Science learning outcomes. The hypothesis was tested by using the hierarchical test - Wilcoxon marked. The formulation of the null hypothesis (H_0) and its alternative hypothesis (H_1) as follows:

H_1 : There is no difference in Surrounding Environment Exploration (SEE) approach to the Natural Science learning outcomes of second grade mental retardation students in SDLB B-C Kepanjen Malang City.

H_0 : There is a difference Surrounding Environment Exploration (SEE) approach to the Natural Science learning outcomes of second grade mental retardations students in SDLB B-C Kepanjen Malang City.

Based on different test using hierarchical test - Wilcoxon marked. The test result can be seen in table 3 bellow.

Table 3: Different Test

No	Name	Value		Different (Yi-Xi)	Level
		Pre test (Xi)	Post test (Yi)		
1	Al	30	80	**50**	6.5
2	Az	30	70	**40**	4.5
3	Bl	10	70	**60**	8
4	Dw	30	80	**50**	6.5
5	Hq	60	90	**30**	2
6	Ns	50	80	**30**	2
7	Rz	40	80	**40**	4.5
8	Yg	50	80	**30**	2
amount					T = 36

Based on the value of $T_{calculated}$:
If $T_{calculated} < T_{table} = H_0$ failed to reject
If $T_{calculated} > T_{table} = H_0$ rejected
It can be shown that $T_{calculated} = 36$
T_{table} (at $\alpha = 0.05$ and $N = 8$) = 6
T (36)> T 0,05 (6) then H_0 is rejected, it can be concluded that the use of Surrounding Environment Exploration (SEE) approach is really influence the Natural Science learning outcomes of second grade mental retardation students in SDLB B-C Kepanjen Malang City.

Pre Test was hold to know how far the students can master the materials. At the Pre Test was done in four times to measure values stability, it can bee seen from the answers of students still tend to have difficulties in answering, anxious and lack of confidence. The attitude of students are always turn their head to get help from teacher. Habits of students who are always assisted when working on the test make them feel lack of confidence with their own ability. The findings of this research are t is known that the average score of pre test is 37,5 so it can be concluded that the Natural Science learning outcomes before implementing Surrounding Environment Exploration (SEE) approach is in the bellow category.

The Natural Science learning outcomes of mental retardation students after implementing the Surrounding Environment Exploration (SEE) approach is increasing after learning and treatments, this is in line with the opinion of Alimah (2010), the SEE approach has significance as follows: 1) the teaching and learning activities are always associated with real world situations, 2) can develop scientific attitudes to students, 3) more meaningful learning process and 4) open students thinking insights into diverse. Although at the beginning of the treatments, students are still confused because it is the first time they are given the responsibility to help solve problems that are appropriate to their environment, the

students quickly adapt because the material is prepared using real problems and solved using real context in accordance with the ability of the mental retardation students.

The existence of interaction between friends during the discussion provide an atmosphere of learning in accordance with the steps of Surrounding Environment Exploration approach. The teacher as a motivator and facilitator, slowly becomes a companion of learning. At the time of drawing conclusions students argue in accordance with the results of the discussion. If there is an inappropriate answer the teacher straightens and gives guidance. At the time of doing post test, students already feel confident. It can be seen from post test values which obtain categorized as good with an average score of post test of 78.75.It can be concluded after the Surrounding Environment Exploration approach taught, Natural Science learning outcomes is in the good category.

After hypothesis testing, the results show $T_{calculated}$ (36)> T_{table} (6), then Ho is rejected. The conclusion is that there are differences in the Natural Science learning outcomes of mental retardation students before and after taught with Surrounding Environment Exploration (SEE) approach. So it can be concluded that Surrounding Environment Exploration (SEE) effect on the ability of Natural Science in mental retardation students.

Recommendation

The findings above can be used as consideration for the following recommendations:

1. For schools it is suggested to be used as a reference for a new approach to improve the learning of Natural Sciences using the conventional approach with the Surrounding Environment Exploration approach.
2. For teachers need to develop Surrounding Environment Exploration approach in accordance with the children problems through learning activities, by:
   a. Changing the learning model contained in lesson plan which is given by school based on applicable curriculum.
   b. The need of learning situation that involving the students as *student center,* teacher only acting as facilitator and motivator.
   c. The material used should be adjusted to the real conditions
3. For the next researcher is expected to develop the research by implementing the Surrounding Environment Exploration (SEE) approach on the subject with different characteristics, to provide a broader knowledge.

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The Relationship between Organizational Commitment, Leadership Style and Compensation on the Improvement of Teacher Performance

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Abstract
An organization is required to handle the human resources appropriately, by the effort to improve employee performance, it can make the organization more dynamic and also will grow rapidly. Many factors affect the performance of employees, several important factors among other factors are organizational commitment, leadership styles and compensation on teacher performance. This study aims to analyze the effect of organizational commitment, leadership styles, and compensation on the improvement of teacher performance. The research method is by the use of survey explanatory. Data collection techniques is by the use of rating scale ranges from number 1 to 5. The respondents are from Lembaga Kursus Al Qur'an (Quran Learning Course) Al Falah in Surabaya. The independent variables in this study consisted of organizational commitment (X1), leadership styles (X2),and compensation (X3) while the dependent variable is the teacher performance (Y). The population in this study amounted to 66 teachers. Data were analyzed using path analysis method. This research showed that partially organizational commitment, leadership styles, and compensation which have a positive and significant effect on teacher performance, both directly and indirectly through organizational commitment. Referring to these results, the organizational commitment, leadership styles and compensation can be a reference for improving the teacher performance.

Keywords: *Compensation, Leadership Style, Organizational Commitment, Teacher Performance*

Introduction

In the last decade, overtly or veiled there has been "free fight competion" which also applies "survival for the fittest" as the effect of liberalization and globalization. In line with these global demands, education has become an industry, an industry that aims to produce good citizenship of a country (Betonio, 2015), and is the basis for the development of modern society (Vrgovic & Pavlovic, 2014).

Speaking of educational issues, it certainly can not be separated from what is called school, because the school is the most important place for students to learn and develop education and social competence (Tehseen & Hadi, 2015), improve achievement, and provide quality education experience for all Students (Elliot, 2015).

Likewise, schools and teachers are both interdependent, interdependent and inseparable. The teacher plays an important role in the learning process of students (Alam & Farid, 2011) (Tehseen & Hadi, 2015) and is a very valuable resource (Aslam, Ghaffar, Talha, & Musthaq, 2015) in an organization, . Therefore, the performance of teachers is highly regarded, and strives to be improved (Markos & Sridevi, 2010), and develop their competence appropriately, so the organization will become dynamic and expanding rapidly. Because the performance of teachers is the main pillar as well as the wheel of the organization in an effort to realize the vision and mission of the organization.

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However, the practice to realize and achieve these goals schools often face obstacles, one factor is the performance of teachers who have not been optimal. With regard to these performances, based on behavioral theory, many influencing factors include organizational commitment and leadership style and organizational compensation. These three factors are used as the study of this research. So this study aims to explain the effect of organizational commitment and leadership style and organizational compensation on teacher performance.

The formulation of the problem in this research, among others; Does organizational commitment partially affect the performance of teachers?, Does the leadership style partially affect the performance of Teachers ?, Is the organization compensation partially affect the performance of teachers?, Does organizational commitment, leadership style and organizational compensation simultaneously affect Master's performance ?.

Literature Review

Commitment something interesting and challenging that can be researched in the field of management and organizational behavior (Dixit & Bhati, 2012). Organizational commitment is an attitude that demonstrates employee loyalty and is an ongoing process of how an organization member expresses their attention to the success and goodness of the organization (Luthan, 2006: 243). Commitment is one of the most important constructions maintained within the organization over the years, as organizational commitment is closely linked to increased job satisfaction, higher performance, and low absenteeism and willingness to move (Yousef, 2000). As Mathis and Jackson said in Sopiah (2008: 155). "*organizational commitment is degree to which employee believe in and accept organizational goals and desire to remain with the organization"*. Organizational commitment is the degree to which employees believe and accept organizational goals and will remain or will not leave the organization. There are three dimensions that explain the relationship between organizational commitment with employees, Meyer and Allen (2001: 13). These dimensions are:

1. Affective commitment (affective comitment):
   Refers to the emotional attachment, identification and involvement of an employee to an organization.
2. Continuity commitment:
   Commitment based on loss associated with the discharge of employees from the organization. This may be due to a loss of seniority over promotions or benefits.
   3. Normative Commitment:
   Normative commitment is concerned with feeling obliged to remain in the organization because it must be so; It is the right thing to do.

According to Mathis and Jackson in Sopiah (2008: 155) elements of organizational commitment include:

1. Trust
   The existence of a strong sense of trust from within the employees to the goals and values of the organization that exist within the company.
2. Will
   The willingness of employees to work hard for the achievement of organizational goals.
3. Desire
   There is a strong desire to maintain a position as an employee within a company

The existence of a sense of employee confidence in the organization, the willingness of employees to work hard and a strong desire to prove how strong organizational commitment in the employees. A strong sense of trust, will and desire will foster a sense of belonging, involvement, and linkage (high loyalty) to the company. Thus lead to increased employee performance so that organizational goals can be achieved.

From the results of the above exposition, organizational commitment becomes important, as it is a powerful tool to bind employees to the organization and increase productivity (Kavita, Simran, Pramod, Lalit, & Sunil, 2012) and effectiveness (Geneviciute-Janoniene & Endriulaitiene, 2014).

Leadership Style

Gary Yukl (1994: 5), Leadership: *"... leadership is defined broadly as influence processes affecting the interpretation of events for followers, the choice of objectives for the group or organization, the organization of work activities to accomplish the objectives, the motivation of followers to achieve the objectives, the maintenance of cooperative relationships and teamwork, and the enlistment of support and cooperation from people outside the group or organization".*

Rivai (2004: 64) defines "leadership style is a set of features that leaders use to influence subordinates to achieve organizational goals. While Hasibuan (2003: 167) states: "The style of leadership is the norm that is moved by someone when the person is trying to influence the behavior of others as he sees."

House in Robbins (2006: 448) states that there are three styles of leadership are:

1. Leadership Style Directive

Leadership style directive is a leadership style that has a positive relationship with the satisfaction and expectation of subordinates.

2. Supportive Leadership Style

Supportive leadership styles pay attention to the needs of subordinates, show concern for employee welfare and create a friendly atmosphere in the work unit of employees.

3. Participatory Leadership Style

Leadership style that asks and uses subordinate suggestions in order to make decisions.

Compensation

Compensation is one of the most complex and dynamic issues (Ibojo & Asabi, 2014) because compensation holds enormous considerations within an organization and is one that acts as a transition or transition segment between employees with organizations (Ghazanfar, Chuanmin, Khan, & Bashir, 2011) (Mphil, Ramzan, Zubair, Ali, & Arslan, 2014).

Compensation is something that employees receive identically with wages, salaries, and so on, which provide income and benefits. While the compensation organization is a cost that must be incurred to increase productivity or the ability of employees (Gerhart, Minkoff, & Olsen, 1995). Components of measuring instruments, among others.

1. Financial Compensation
    a. Salary generally applies to weekly, monthly, or annual pay rates (regardless of length of working hours). Wages are usually associated with hourly pay rates (the longer the hours they work, the greater the pay).

b. Incentives, additional compensation above or beyond salary or wages provided by the company. Incentive programs are tailored to provide additional payments based on productivity, sales, profits, or cost enhancement efforts.
c. Benefits, additional compensation given under the company's policy to all employees in an effort to improve employee welfare. For example: health and life insurance, corporate holidays, retirement plans, and other benefits related to employment relationships.

2. Non-financial Compensation
   a. The work itself
   Includes tasks that attract challenges, responsibilities, recognition, sense of accomplishment.
   b. Work environment
   Includes sound policies, competent supervision, fun co-workers, comfortable working environment.
   c. Amenities
   Compensation provided by the company to employees as a support for the smooth to work and motivate employees to the spirit of work, for example: company car, special parking, places of worship, comfortable working space, and others (Simamora, 2004).

It is said by Aslam, Ghaffar, Talha, & Musthaq (2015), that compensation can motivate employees in this case the teacher for better performance.

Teacher Performance.

According to Bernadin and Russel (in Timpe, 1992: 30), performance is the result of a function of a particular occupation or activity in which it consists of three aspects: 1) the clarity of the task or job to which it is responsible, 2) the expected clarity of the result Of a job or function, 3) the time it takes to complete a job in order for the expected results to materialize.

Hoy and Miskel (1978: 221), argued that performance is an ability in performing tasks or jobs in accordance with attitudes, knowledge and skills and employee motivation. They mentioned several characteristics of the performance: 1) performing tasks according to organizational expectations, 2) using available office equipment, 3) high spirits, 4) having good relations with superiors and with peers, and 5) Problems related to routine tasks performed every day.

While Depdiknas (Indonesia's Department of Education) (2000: 23), defining the performance of teachers is the ability of teachers in carrying out their duties. In Law No.20 of 2003 article 39 paragraph 1, explaining that the task of education tasked to carry out administrative management, development, supervision, and technical services to support the educational process in the unit of education. Article 39 paragraph 2 educators are professionals in charge of planning and implementing the learning process, assessing learning outcomes, conducting mentoring and training, and conducting research and education to the community, especially for educators at universities.

Teacher performance is the result of the assessment of the process and the work achieved by the teacher in performing its duties. (Permendiknas (Indonesia's Ministry of Education Regulation) Number 35 Year 2010). With variables (1) Planning learning, (2) Implementing learning, (3) Assessing learning outcomes, (4) Implement follow-up assessment, and (5) Implement self-development.

There are several indicators that measure teacher performance, ie work quality, speed / work accuracy, work initiatives, work skills and communication. Performance indicator is a measure of the work of employees both seen from both quantitative and qualitative aspects of the level of achievement of objectives and work achieved. The indicators of teacher performance are the quality of work, the speed / determination of work, the initiative in work and the ability of work and communication (Uno & Lamatenggo, 2013).

In general, Rosyada (2004: 112) explains that a teacher and employee must meet two categories that have capability and loyality, that teachers and employees must have the ability in the field of science taught, has the theoretical ability of good teaching, from planning, Implementation and evaluation, and has loyality of teachers and employees, loyal to casual and employee tasks that are not exclusively in the classroom, both before and after class.

Based on the literature review above, it can be described framework as shown in Figure 1 below.

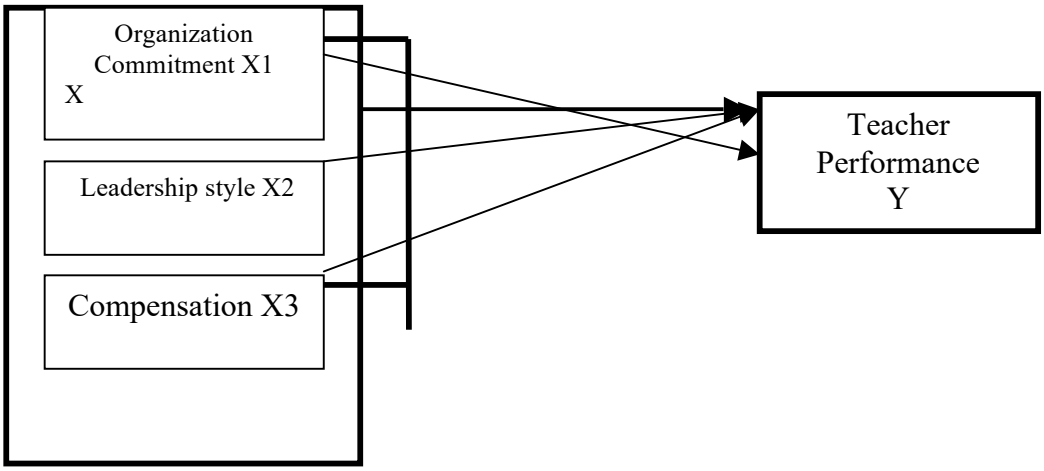

Figure 1. Framework for Thinking

The above frame of mind, can be translated into the following hypotheses:

H1: there is an effect of organizational commitment (X1) on teacher performance (Y)

H2: there is influence of leadership style (X2) on teacher performance (Y)

H3: there is influence of compensation (X3) on teacher performance (Y) through organizational commitment (X1)

H4: there is a simultaneous influence between Organizational Commitment (X1), leadership style (X2) and Compensation (X3) influence simultaneously on Teacher's performance (Y)

Design/Procedure

Explanatory survey method is the method chosen in this study. This method is done by collecting factual information using a questionnaire as a tool. Respondents from this research are 66 teachers at Al Qur'an Foundation Al Qur'an Foundation.

The data collection instrument used in the form of a Likert scale model questionnaire consisting of four parts. The first section is a questionnaire to measure respondents 'perceptions of teachers' performance as outlined in the five indicators, namely quality of work, work accuracy, work initiatives, work skills, and communication. This section consists of 15 items. The second part is a questionnaire to measure respondents' perceptions of organizational commitment outlined from the three indicators of affective commitment, ongoing commitment, and normative commitment. This section consists of 20 items. The

third section is a questionnaire to measure respondents' perceptions of leadership styles outlined in three indicators: Leadership leadership, Supportive leadership, and Participatory leadership. This section consists of 15 items. The fourth section is a questionnaire to measure respondents' perceptions of compensation outlined in six indicators: salary or wages, incentives, benefits, employment, work environment, and facilities. This section consists of 18 items.

Descriptive statistics use average scores used to obtain an overview of respondents' perceptions of teacher performance, organizational commitment, leadership style, and compensation. Inferential statistics use path analysis used to test hypotheses. In this study the data of each variable measured in the form of ordinal scale, but because the data requirements on data processing with the application of parametric statistics should be an interval scale, then all ordinal data that have been obtained by the researchers converted into an interval scale using the Method Successive Interval (MSI) through Microsoft Office 2010 software.

Findings/Analysis

Organizational Commitment

Organizational commitment has an average score of 3.50. The score indicates that organizational commitment is in the high category according to the respondents. The average score of each indicator is presented in table 1 below.

Table 1 Description of Organizational Commitment

Indicator	Average	**Category**
Affective Commitment	3.21	Medium
Sustainable Commitment	3.73	High
Normative Commitment	3.59	High
Average	**3.53**	High

The highest score is on an indicator of ongoing commitment. This result shows teacher objection in leaving LKF and teacher's desire to remain LKF teacher is in high category. The affective commitment indicator has the lowest average score. This result implies that the teacher has not had any feelings about LK yet, the teacher has not had an emotional relationship with LKF, and the teacher also does not have feelings to be a part of LKF.

Compensation

Average teacher performance score of 3.27. This shows according to perception of respondent teacher performance is in medium or enough category. Table 2 presents the average scores of each indicator being compensated.

Table 2 Description of Compensation

Indicator	Average	**Category**
Salary and Wages	3.10	Medium
Incentive	2.87	Medium
Allowance	3.24	Medium
Work Itself	3.40	High
Work environment	3.66	High
Amenities	3.40	High
Average	**3.27**	Medium

The highest score is on the work environment indicator. These results indicate a healthy LKF environment, pleasant co-workers, and fair policies from LKF are in the high category.

Incentive indicators have the lowest average score. This result implies that the incentive given by LKF to teachers has not been optimal. This is because the incentives provided have not motivated teachers to work more productively, incentives are not fair and equitable, and the satisfaction has not been obtained from the incentives received.

Teacher Performance

Respondents assess the performance of teachers according to their perceptions are in moderate or sufficient category, it is shown with the average score of teacher performance of 3.15. The indicators used as teacher performance measures are presented in table 3 below.

Table 3 Teacher Performance Descriptions

Indicator	Average	Category
Work quality	3.57	High
Speed / Accuracy of Work	3.17	Medium
Initiatives at Work	2.64	Medium
Work ability	3.22	Medium
Communication	3.15	Medium
Average	**3.15**	Medium

The highest score is on the quality of work indicator. These results indicate that the planning of the learning program, the selection of teaching materials, and the application of research results in the learning that has been done by the teacher is in the high category. The work initiative indicators have the lowest average score. This result means that teachers have not been able to use the media in learning, the use of LKF inventory that has not been wisely, and teachers are also not skilled in the use of varied learning models.

H1: Effect of Compensation on Teacher Performance

After the hypothesis is calculated, the value of ttable or critical value at degrees of freedom (db) = n - k - 1 = 35 - 2 - 1 = 32 and α = 0,05 is ttable = 2,0369. The tcount obtained is tcount = 2.1581. Based on these results, the tcount is greater than the ttable (2.1581> 2.0369), then H0 is rejected and H1 is accepted. The direct effect of compensation on teacher performance is 0.1229 or 12.29%. While the indirect effect of compensation on teacher performance through organizational commitment is equal to 0.1061 or 10.61%. The calculation of the correlation coefficient between the variable compensation on teacher performance obtained in this study amounted to rx1y = 0.6532. Coefficient of other variable path outside compensation variable equal to 77,10%.

Employee performance in particular in this study is that teachers rely on effective planning, implementation, and control of compensation management (Ibojo & Asabi, 2014). Compensation also acts as a predictor in improving employee performance, although it does not mean that leaders can directly affect employee performance but require fair and equitable compensation, leading to increased employee or teacher performance (Rizal, Idrus, & Djumahir, 2014) and can increase efficiency Employees (Aslam, Ghaffar, Talha, & Musthaq, 2015).

H2: The Effect of Organizational Commitment on Teacher Performance

After the hypothesis is calculated, the value of ttable or critical value at degrees of freedom (db) = n - k - 1 = 35 - 2 - 1 = 32 and α = 0,05 is ttable = 2,0369. The thitung value obtained is

thitung = 2.7704. Based on these results, the tcount is greater than the ttable (2.7704> 2.0369), then H0 is rejected and H1 is accepted. The magnitude of the direct influence of organizational commitment on teacher performance is 0.2025 or 20.25%. The calculation of correlation coefficient between organizational commitment variable on teacher performance (rx2y) obtained in this study is 0.6858. The coefficient of other variable path beyond organizational commitment variable is 79,75%.
A similar study of the relationship between organizational commitment and employee or teacher performance also resulted in organizational commitment having a positive effect on employee or teacher performance (Rizal, Idrus, & Djumahir, 2014) (Khan, Ziauddin, & Ramay, 2010).

H3: Effect of Compensation on Teacher Performance through Organizational Commitment

After the hypothesis is calculated, the value of Ftable or the critical value at degrees of freedom (db) = n - k - 1 = 35 - 2 - 1 = 32 and α = 0.05 is Ftable = 3.2945. The tcount value obtained is Fcount = 18.5990. Based on these results, the value of Fcount is greater than Ftable (18.5990> 3.2945), then H0 is rejected and H1 is accepted. The magnitude of the direct effect of compensation on teacher performance is 0.1229 or 12.29%. While the indirect effect of compensation on teacher performance of 0.1061 or 10.61%. In addition, it is also known that the magnitude of the effect of organizational commitment on teacher performance is 0.2025 or 20.25%. Big influence of compensation on teacher performance through organizational commitment equal to 0,1061 or 10,61%. The coefficient of the other variable path outside the observed variable of 56.58%.

Recommendation

The compensation measured through salary or wage indicator, incentives, allowances, work itself work environment, and facilities are in moderate or sufficient category. Organizational commitment as measured by indicators of affective commitment, ongoing commitment, and normative commitment are in the high category. Teacher performance measured by quality of work indicator, work accuracy, work initiative, work ability, and communication are in moderate or sufficient category.

Compensation has a positive and significant effect on teacher performance. Thus the increase in teacher compensation will be followed by improvements in teacher performance.
Organizational commitment has a positive and significant effect on teacher performance. This means that any increase in teacher commitment to the organization will be followed by improved performance. Compensation not only directly affects directly, but also positively indirectly influenced through other variables studied in this study, namely organizational commitment.

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Recycling Awareness among BSTTE-IT Students

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Abstract

This study aimed to determine the level of recycling awareness among the BSTTE-IT students and how their profile plays an important role with it. A total of 80 respondents from Third Year and Fourth Year Industrial Technology students enrolled in the Bachelor of Science in Technology Teacher Education program offered by the Department of Technology Teacher Education of the College of Education in Mindanao State University – Iligan Institute of Technology are the participants of the present study conducted during the second semester of the S.Y. 2015-2016.

The researchers used the survey method using researcher-modified questionnaire and was administered to 80 students. It has three parts. The first part contains the profile or the personal background of the respondents such as their age, gender, family monthly income, parent's educational attainment, ethnicity, religion and affiliation to environment-related activities.

The findings revealed that majority of the respondents are females of ages between 19-21 years old; and, majority are Roman Catholics, whose parents are college graduates and have a family monthly income of P5, 000.00 and below. Majority of them are Cebuano and have affiliations to environment-related organizations. It is also found out that *Plastics* are dominantly seen around the respondent's surroundings.

Findings further revealed that respondents are *Highly Aware* in paper recycling while *Moderately Aware* in bamboo recycling, plastic recycling, shell recycling and general recycling practices. Furthermore, it also revealed that the profile of the respondents does not affect their environmental awareness in terms of bamboo recycling, plastic recycling, shell recycling and general recycling practices. However, family monthly income is a significant factor to their paper recycling practices.

Keywords: *Environmental Awareness, Recycling Awareness, Recycling Practices, Student Environmental Awareness*

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Introduction/Problem

Over the years, people across the world are continually faced to tremendous challenges involving abrupt changes in the environment. Among these are the massive influx of natural disasters, pollution, global warming and climate change. As of the moment, this has been a burden to the present generation, for they are the ones who are highly affected by these changes. Apparently, these are rooted from the improper management of people to the resources in the environment as well as the lack of environmental awareness among the citizens. Understandably, when a person does not know the negative effects of his wrongdoings to his environment and does not care to acknowledge environmental distractions, he will never stop doing it, which would only add up to the arising problems in his surroundings. With that, he will continually do the same practices towards his environment for he thinks that he is doing nothing wrong. If the problem stays unresolved, it will eventually lead to further devastation in our environment.

Environmental awareness in a broad sense does not only refer to one's knowledge about the environment. It also talks about a person's knowledge, skills, and attitude that are needed to solve environment-related concerns. Environmental problem solving must have all the three core preservation essentials which involve awareness, knowledge and practice (Dale, 2001; Olofsson and Ohman, 2006) as cited by Malek et al., (2014). Awareness alone is not sufficient and meaningless in the absence of action which is needed to be taken to preserve the environment and to ensure the success of measures taken to preserve the environment. It is an important factor that a concerned individual must possess to show affection towards his environment. In the same manner, people need to have a sense of love for the environment because a sustainable environment is indeed basic for a harmonious and sustainable development (Sani, 2007) as cited by Malek et al., (2014).

Philippines ranks as the 9th most populous country in Asia and the 14th in the world according to Philippine Sustainable Development Network (2017). Therefore, there are millions of Filipinos that can be agents of change in preserving the promise land and the Mother Earth. As the famous saying goes, 'youth is the hope of the nation', thus they are the main agents of this change.

Mindanao State University – Iligan Institute of Technology, a well-known university that aims to provide quality education is an institution with diverse youths. According to the Registrar Office of the University, as cited in the study of Galvez et al., (2016) there were a total of 12,436 registered students as of 2014. If these students were to throw a garbage per day, garbage collectors would be collecting thousands of garbage everyday also. In the context of waste production, according to the study of Zabala (2012), plastic wastes comprise the greater bulk of wastes generated in the institute.

College of Education (CED) specifically CED Cafeteria, is the highest producer of biodegradable wastes with a total of 72 kilos in roughly nine days. It produced the least quantity of waste among the three food service centers (CBBA Business Centers and IDS Main Canteen) since most of its discarded wastes are biodegradable. For Non-Biodegradable, these include Plastic, Paper, Residual and others. Plastic wastes comprise the greater bulk of wastes generated from CED Cafeteria but has been reduced because of its "No Plastic Policy" especially for take-out foods (Zabala, 2012). The said college has been active in participating and initiating environmental activities, projects and programs in and outside the campus. Among its 4 departments, 1 of which, the Department of Technology Teacher Education (DTTE), offers a program with one environment-related subject called *Handicraft* which discusses recycling. With this, students were taught how to recycle a variety of recyclable materials such as paper, bamboo, plastic, shell, etc. This prompt the researchers to conduct a

study that would determine the level of recycling awareness among the students in the College of Education especially to those who have environment-related subjects. Investigating the students' recycling awareness is necessary to measure how far these students are concerned and are willing to take actions from the environment's call for change.

Environmental concerns are gradually uprising every now and then. Apparently, people nowadays can feel noticeable changes happening every single day. Saving our Mother Earth from its total destruction could be a lead for a better generation to come and recycling could be our hope to realize this dream.

Design/Procedure

This study aimed to determine the level of recycling awareness among the BSTTE-IT students and how their profile plays an important role with it. Researchers followed a descriptive research design. The researchers used the survey method using researcher-modified questionnaire and was administered to 80 students. It has three parts. The first part contains the profile or the personal background of the respondents such as their age, gender, family monthly income, parent's educational attainment, ethnicity, religion and affiliation to environment-related activities. The second part is purely a list of statements about one's recycling practices, designed in a tabular form where respondents need to specify whether they (a) Strongly Agree, (b) Agree, (c) Disagree or (d) Strongly Disagree on a particular statement. The third part is also a list of statements in the same format as to the second part but on a different area as it talks about one's activities that reflects his/her general knowledge about recycling. The statements are subdivided into 3 categories, namely; knowledge, skills and attitude. In the data gathering, questionnaires were given to the respondents and kept by the researchers for confidentiality. Data were analyzed using SPSS Software.

Findings/Analysis

Profile of the respondents in terms of the following:

Age

Most of the respondents have ages between 19-21 years old which constitutes 55 or 68.8% out of the total number of respondents. On the other hand, the age range that received the least number of responses are ages 16-18 which only constitutes 3 or 3.8% out of the total number of respondents. According to Philippine Statistics Authority (2017), Tertiary/Baccalaureate Education (Level 5) is comprised of students whose age ranges from 16-20 years old. Respondents in the study were Third Year and Fourth Year students. As a result, majority of the respondents belong to the age range of 19-21 years old.

Gender

Most of the respondents are female which comprises 59 or 73.8% while there are only 21 respondents who are male constituting 26.3% to the total number of respondents. This reveals that majority of the respondents are female. BSTTE-IT is an Education course, basically, it will more likely attract female enrollees. This is supported by the study of Yüce, K., Şahin, E.Y., Koçer, Ö. et al. (2013), as for sex-type rating, it was claimed that the teaching profession has been perceived as being intrinsic to women.

Family Income

In terms of monthly income, the highest frequency of 26 or 32.5% are respondents' whose parents' earn ₱5,000.00 and below. Meanwhile, the lowest frequency of 15 or 18.8% are those who earn ₱10,001.00 – ₱15,000.00 and ₱15,001.00 and above, respectively. This ndicates that majority of the respondents has a family monthly income of ₱5,000.00 and below.

Father's Educational Attainment

Among the 80 respondents, 22 or 28% of their fathers are both College Graduate and High School Graduate which has the highest number of responses and 3 or 3.8% of their fathers are in Elementary Level with the lowest number of responses. This reveals that majority of the respondents' fathers are both High School Graduate and College Graduate.

Mother's Educational Attainment

The highest frequency count of 25 or 31.3% to the respondents whose mothers are college graduate while the lowest frequency count of 1 or 1.3% is to a respondent whose mother is elementary graduate. This reveals that majority of the respondents' mothers are College Graduate.

Religion

Among the 80 respondents, 63 or 78.8% are Roman Catholics which have the highest number of responses and only 1 or 1.3% is Church of God with the lowest number of responses. This reveals that majority of the respondents are Roman Catholic. This is supported by the article posted by **Jack Miller in Asia Society (2017) that the** Philippines proudly boasts to be the only Christian nation in Asia. More than 86 percent of the population is Roman Catholic.

Ethnicity

Among the 80 respondents, 65 or 81.3% are Cebuano which has the highest number of responses and 2 or 2.5% are Higaonon which has the lowest number of responses. Since 1948, Visayan-speaking, indigenous peoples, also known as settlers, make up the majority population of Mindanao, and since 1970, they make up about seventy percent of the total population (Readings in History 3, 2014). Thus, there is no doubt that the data reveals that majority of the respondents are Cebuano.

Affiliation to Environment-related organizations

Among the 80 respondents, 73 or 91% of the respondents admit that they are associated with environment-related organizations while 7 or 9% admit that they are not. This reveals that majority of the respondents have affiliation to Environmental Organizations.

Recyclable Materials found around the Respondent's Environment

A total of 77 respondents revealed that *Plastics* are present in their area. This is closely followed by another 68 respondents who claimed that recyclable *Papers* are evident in their surroundings. In addition, 66 respondents are aware of the *Bottles* around them that have potential to be recycled. Another 56 respondents claimed that there are a lot of *Bamboo* in their surroundings, 47 respondents revealed the availability of recyclable woods in their area and another 35 respondents claimed that shells are present near them. Lastly, 28 respondents registered to have seen *Steels* around their places. This statistical data only reveals that *Plastics* are dominant in their area while S*teels* are less likely dominant.

Respondent's Level of Recycling Awareness According to their Recycling Practices

This part presents the respondent's level of recycling awareness according to their recycling practices. To help with the description and interpretation of the means score the range of means below was used.

Range of Means	Interpretation	Description (Knowledge)	Description (Skills)	Description (Attitude)	Description (General)
3.25 – 4.00	Strongly Agree	Highly Knowledgeable	Highly Skillful	Highly Practiced	Highly Aware
2.50 – 3.24	Agree	Knowledgeable	Skillful	Practiced	Moderately Aware
1.75 – 2.49	Disagree	Not Knowledgeable	Not Skillful	Not Practiced	Moderately Unaware
1.00 – 1.74	Strongly Disagree	Highly Not Knowledgeable	Highly Not Skillful	Highly Not Practiced	Highly Unaware

Table 1. Descriptive Statistics among the Respondent's Paper Recycling Practices

Paper Recycling	Mean	SD	Interpretation	Description
Knowledge	*3.72*	*0.535*	*SA*	*Highly Knowledgeable*
Skills	*3.33*	*0.528*	*SA*	*Highly Skillful*
Attitude	*2.82*	*0.567*	*A*	*Practiced*
Over-all Mean	3.29	0.474	*SA*	*Highly Aware*

The table revealed that the respondent's total responses in the practice of Paper Recycling generated a total weighted mean of 3.29, which denotes that the respondents are *Highly Aware* in paper recycling. This is according to the scale used in the Interpretation of the Weighted Mean (refer to Table 1. Scale in the Interpretation of the Weighted Mean). This result implies that the availability of papers in the respondent's surroundings which is obviously unlimited influenced their awareness on paper recycling. Also, they are highly aware about paper recycling because it is included in their handicraft classes at school (refer to Appendix E. Course Syllabus of INDTECH 105 - Handicraft).

Table 2. Descriptive Statistics among the Respondent's Bamboo Recycling Practices

Bamboo Recycling	Mean	SD	Interpretation	Description
Knowledge	*3.53*	*0.556*	*SA*	*Highly Knowledgeable*
Skills	*3.01*	*0.545*	*A*	*Skillful*
Attitude	*2.72*	*0.607*	*A*	*Practiced*
Over-all Mean	3.12	0.478	*A*	*Moderately Aware*

The table 2 shows that the respondent's total responses in this particular area generated a total weighted mean of 3.12, which denotes that in terms of their environmental awareness in bamboo recycling, the respondents are considered to be *Moderately Aware* about it. Availability of bamboo in the area is very limited, thus, it partly affects the respondent's awareness on bamboo recycling.

Conclusions

Based on the forgoing findings of the study, the following conclusions are drawn:

1. It was found out that *Plastics* are very dominant around the respondents' environment.
2. It was found out that respondents are Highly Aware in Paper Recycling while in bamboo recycling, plastic recycling, shell recycling and general recycling practices, they only showed a moderate level of awareness.
3. It was found out that family monthly income is significant with paper recycling. Thus, null hypothesis stating that there is no significant relationship between respondent's profile and environmental awareness in recycling in terms of knowledge, skills and attitude is partially rejected.

Recommendations

1. It is recommended that Plastic Recycling be given due emphasis in the course syllabus of the Bachelor of Science in Technology Teacher Education (BSTTE) IndTech105 – Handicraft subject offered by the Department of Technology Teacher Education (DTTE) since plastics are very dominant around the respondents' environment. It will not only make use of the available resources but it will also lessen environmental problems brought by plastic wastes. At the same time, it will also help develop the student's creativity in making plastic crafts.
2. It is recommended that the institute may have a comprehensive scheme for plastic waste minimization.
3. It is recommended that instructors, administrators and stakeholders may look closely on how to consider socio-economic profile, specifically family monthly income in the practice of recycling.
4. Further recommendation for the instructors to plan of a sustainable recycling program that will increase the level of students' awareness on recycling and their likelihood to recycle more often.
5. It is recommended that MSU-IIT as a leading university, administrators, instructors or persons involved may initiate activities such as symposiums, presentation of dissertations and other studies, seminars, conferences and trainings to expose the students to global and local environmental issues.
6. It is also recommended to intensify the existing environmental educational programs such as the plastic bottle recycling bins project of the Department of Physical Education in the College of Education for better accessibility and to plan for more sustainable environments.
7. Future studies are also recommended to include students' Grade Point Average (GPA) to analyze the impact of their grades on their recycling behavior.
8. For future researchers whose studies are environmentally inclined and desires to determine one's environmental awareness, it is best recommended to select respondents who do not have any environment-related affiliations because their

awareness would be purely from their individual knowledge, skills and practices. It is not yet influenced by some factors such as their environmental affairs.

9. Future studies are recommended to focus on the application of the environmentally friendly behavior on recycling for sustainable development.

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The Influence of Learning Media Things Around Children Toward Comparing Ability of Hearing Impairment Students

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Abstract

Hearing impairment would have disturbance if the information which the children obtained was in the form of verbalization, because it required listening ability and thinking training. Therefore, hearing impairment children had obstacle in understanding the abstract things, such as mathematics. Hence it needed to develop ability to learning mathematics, one of them was comparing using things around children as learning media because they were easy to find and fast to be recognized so that they could attract the children desire. This research had purpose to describe whether there was influence of using things around children learning media toward comparing ability in learning mathematics of second grade hearing impairment students in Special School Asih Mulya.This research used quantitative approach with pre Experimental kind and one group pretest and posttest design. The independent variable was "learning media things around children" and the dependent variable was "comparing ability". The subject was second grade hearing impairment students numbering 6 people. The data collection used writing test and the data analysis used sign test. This research result indicated that there was enhancement of average value of comparing ability i.e. pre-test was 33.33 and in post-test the value became 70. Z count value obtained was 2,05 and Z table 5% to two sides test was 1,96 so it could be concluded that Ho was refused and Ha was accepted. Based on the explanation above it could be concluded that there was significant influence of using learning media things around children learning media toward comparing ability in learning mathematics of second grade hearing impairment students in Special Schools Asih Mulya Pamekasan.

Keywords: *Comparing Ability, Hearing Impairment Students, Learning Media, Things Around Children,*

Introduction

Basically, each child needs an education because it aims to develop the child's ability optimally both knowledge, attitude and skill. It also applies to the child with special's needed such as the deaf child.

On one side, the deaf child has an obstacle in understanding the thing such as abstract's thing because of the hearing limit, on the other side,

> "Mathematic is a field of study which has a higher difficult level because it has an abstract object, built by deductive reasoning that was a concept which had been received as a logic effect from the truth before, so the relation between the concept in mathematic was strong and clear (Depdiknas:2004)".
>
> "Mathematic is a way to find the answer to face the human problem; a way using an information, using a knowledge about the shape and the size, using a knowledge about

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counting, and the most important is that human thinking about themself by watching on it, using the relations (According to Paling in Abdurrahman 2012:30)".

Actually, mathematic is not a new thing for human, because mathematic is learned in our daily life especially at school as a field of study. For a few people especially children, mathematic is a scary lesson. It has been seen from the tense expression of the children when they were facing mathematic lesson (mathematics anxiety).

Many things that can be a reason why the children feel scared to mathematic, there are: first, the first perception of the child who see the mathematic as a difficult lesson, so the child will think that numbers are easy to learn become difficult to understand. Second, mathematic uses the abstract's numbers or unreal so it needs a bit long solution. And third, children don't know why do they have to learn mathematic and use many formulas that make them to be more confused.

As it had been explained in Depdiknas (2004),

"Mathematic is a field of study which has a higher difficult level because it has an abstract object, built by deductive reasoning that was a concept which had been received as a logic effect from the truth before, so the relation between the concept in mathematic was strong and clear".

According to Bruner in Sukayati, (2004:1) stated that,

"Students in learning mathematic concept phase, there are three phases: (1) enactive phase, (2) econic phase and (3) symbolic phase. Enactive phase is a learning phase by manipulating the thing or the object which is concrete, econic phase is a learning's phase by using the picture and symbolic phase is a learning phase by manipulating an emblem or symbol".

Same as that thing, Piaget in Sukayati (2004:1) stated that,

"The level of thinking of the elementary schools child age was still in operational concrete phase which meaned to understand a concept, students should be given that connected with a real thing or real occasion that could be accepted in their mind".

Same as study concept, students who connected with a real thing or real occasion, the using of learning media will make it easier of that learning implementation. With the learning media that is used as a support to explain steps or describe the detail of the learning process. According to Gagne and Briggs (In Arsyad, 2013:4) said that "The learning media includes a tool that is physically used to deliver the content of teaching material". Meanwhile, Anderson (In Sukiman, 2012:28) explained that "The learning media is a media which is enable the realization of a direct connection between the people's creation of the subject developer and students". In other words, according to Arsyad (2013:4),

"Media is a the component of learning resources or physical rides that contain an instructional material in students environment that can stimulate students to study".

Some of the learning media functions according to Faiq (2013) are:

"(1) Student centering (2) Waking up the emotion of students (3) Helping students to understand the learning material (4) Helping students to organize the information (5) waking up the study motivation of students (6) Making the learning to be more concrete (7) Solving the limit of space, time and sense power (8) Activating the learning (9) Reducing the learning possibility that always teacher-centered (10) Activating students response".

The learning media that is used, should be a simple media and known by students. So,it can create the spirit of learning and make it easier to them in understanding the subjects which is teached. In the daily life, there are many objects around the child that can be foundand recognized such as things around the school especially in the class. That objects can be school's equipment and the equipment which is in the classroom. That can be

cultivated as a media so reseachers deliberately bring it into a mathematic's learning media about comparing.

As we know that things can be a school's equipment such as pencil, book, eraser, and ruler are things that a child use it when they are studying especially in mathematics learning. It same as the equipment in the classroom such as chair, white board, and table are things that is used to support the proscess of learning in the class. So the privellege by using the learning media of around objects such as school's equipment and classroom's equipment can be expected to attract the child interest because of the media which is used, is easy to find in the daily life.

Understanding to mathematics learning both addition, substraction, multiplication, and comparing are expected to be more easy to learn by using the object's media around the child such as school's equipment and classroom's equipment especially about comparing like big-small, long-short, and amounts that can be categorized into geometry. It is same as the explanation from Shamsudin (2002:110) who stated that "comparing is to determine charateristics of the similarity or inequality about two or more quantities (amounts) or number". While the intended of geometry is:

> "One of mathematics branch which learns about the point, line, plane and the space of objects and their properties, sizes, and the relationship between each other (Alders (1961))".

According to the reason at the top, the research about "The Influence of Using Things Around Children Learning Media Toward Comparing Ability In Learning Mathematics for Deaf Students In Class Ii Slb Asih Mulya Pamekasan" needs to be implemented.

Literature Review

A. Definition of Learning Media

Hamidjojo (in Arsyad, 2013: 4) stated that, "Media as all form of intermediaries used by human to delivered ideas, concepts, or opinions thus the ideas, concepts, or opinions can be accepted by recipients".

Media can be classified into 3 types, there are: 1) auditive media which rely on voice capabilities such as radio, cassette recorder, and etc; 2) visual media which rely on sense of sight like pictures, films, paints, and etc; 3) audiovisual media which have both sound and picture concept.

Media can be classified based on the materials, there are: 1) simple media which the materials is easily obtained, the price is cheap, both the way of making and use are easy; 2) complex media which the materials is difficult obtained, the price is expensive, both the way of making and use are difficult.

The learning media that is used, should be a simple media and known by students. So, it can create the spirit of learning and make it easier to them in understanding the subjects which is teached. In the daily life, there are many objects around the child that can be foundand recognized such as things around the school especially in the class.

B. Definition of Mathematic

Paling (in Abdurrahman 2012:30) stated that "Mathematic is a way to find the answer to face the human problem; a way using an information, using a knowledge about the shape and the size, using a knowledge about counting, and the most important is that human thinking about themself by watching on it, using the relations".

Ismail, et al (in Hamzah et al, 2014: 48) stated that, "Mathematic is the knowledge about numbers, connecting between numbers and operational procedure used to solving the numbers problems".

Mathematic is learned in our daily life especially at school as a field of study. For a few people especially children, mathematic is a scary lesson. Many things that can be a reason why the children feel scared to mathematic, there are: first, the first perception of the child who see the mathematic as a difficult lesson, so the child will think that numbers are easy to learn become difficult to understand. Second, mathematic uses the abstract's numbers or unreal so it needs a bit long solution. And third, children don't know why do they have to learn mathematic and use many formulas that make them to be more confused.

As it had been explained in Depdiknas (2004), "Mathematic is a field of study which has a higher difficult level because it has an abstract object, built by deductive reasoning that was a concept which had been received as a logic effect from the truth before, so the relation between the concept in mathematic was strong and clear".

C. A Deaf Person

Donald F Moores (in Somad and Hernawati, 1996: 27) state that, "A deaf person is one whose hearing is disabled to exten (usually 70dB ISO grather) that precludes the understanding of speech through the earlone without or with the use of hearing aid. A hard of hearing person is one whose hearing disabled to an exten (usually 35 to 69 dB ISO) that makes difficult but dose not preclude the understanding of speech through the ear alone with out our with a hearing aid".

Procedure

1. The Research Design

This research is impelemented by using a quantitative approach with pre experimental research type with one group pre-test and post-test design.

Data and Resources of Research Data

a. Research Location

This research is located at SLB Asih Mulya Pamekasan where is on KH. Hasan Shinhaji Street No. 111.

b. Research Subject

The subject of this research is students class II at SLB Asih Mulya Pamekasan which contain 6 deaf students.

2. The Data CollectionTechnique

In this research, the data collection techniques which are used, are:

a. Test Method

"Test is a whole of questions or excercises and other tools that are used to measure the skill, the knowledge of intelligence, the ability or the talent which is owned by the child" (Arikunto 2006:150).

The test which is used in this research is a writing test and a deeds test. The writing test which is impelemented in pretest question, and post-test, is to know the cognitive ability or students study result before and after the using of object learning media around the child such as school's equipment and classroom's equipment. While deeds test is used for when the learning process or treatment happens is when the using of object learning media around the child such as shcool's equipment and classroom's class.

b. Observation Method

In this research using participant's observation, that the researcher involves directly and full as long as giving treatment and learning's process

Findings/Analysis

According to the result of data analysis, the Zh (2,05) > Ztable (1,96) so null hypothesis (Ho) is denied and working hypothesis (Ha) is accepted. If Ha is accepted, there will be an impact of the using of the object learning media around the child to the ability of comparing in mathematics learning for deaf students class II SLB Asih Mulya Pamekasan. The data of study's result of the ability of comparing in mathematics learning for deaf students before and after using the object learning media around the child has a different value on the test which is given.

The result's data of the ability of deaf students class II SLB Asih Mulya Pamekasan from the first pretest before giving the treatment was 33,33. That average happened because the deaf child had a difficulty of comparing in mathematics learning that was caused by an obstacle which was owned the deaf child in understanding things such as abstract thing because of the limit in hearing. On the other side,

> "Mathematic is a field of study which has a higher difficult level because it has an abstract object, built by deductive reasoning that was a concept which had been received as a logic effect from the truth before, so the relation between the concept in mathematic was strong and clear (Depdiknas:2004)".

That limitation in understanding abstract things causes the deaf child gives priority by using visual sense to get the information. Just like the explanation from Somad and Hernawati (1996:28) that

> "Because of less of hearing function, the deaf child distracts their vision to the eye, through the eye, the deaf child can understand the spoken language or oral language".
>
> Because of that, one of ways that is used to optimalize the comparing's ability is using the object learning media around the child which is concrete. It is one way with Piaget in Sukayati (2004:1) stated that
>
> "The level of thinking of the elementary schools child age was still in operational concrete phase which meaned to understand a concept, students should be given that connected with a real thing or real occasion that could be accepted in their mind"

In the treatment activity using the object learning media around can push students to be more active in learning activity. It is supported by Faiq's opinion (2013) who stated functions of learning media are

> **"**(1) Student centering (2) Waking up the emotion of students (3) Helping students to understand the learning material (4) Helping students to organize the information (5) waking up the study motivation of students (6) Making the learning to be more concrete (7) Solving the limit of space, time and sense power (8) Activating the learning (9) Reducing the learning possibility that always teacher-centered (10) Activating students response".

The object of learning media around the child which is used, is school equipment's object such as pencil, book, eraser, and ruler also classroom equipments such as chair, white board, and table that is always seen in students' daily life in school's environment. So, the using of the object learning media around aims to increase the interest and the ability of students in mathematics learning especially comparing that the ability can be optimalized as well. It is cleared by Arsyad (2013:4),

> "Media is a the component of learning resources or physical rides that contain an instructional material in students environment that can stimulate students to study".

In the implementation of using the object learning media around was started with setting up student's seat into two lines which contains 3 students in each line so students able to see and focus to the fron when the researcher is explaining. Next is setting up the room with objects which are used such as chair, table and white board that is placed in such way so

students can use it easily. For another objects such as pencil, book, eraser, and ruler are using objects which is brought by students and its already in the classrrom. The using of those objects as a media was supported by Arsyad's opinion (2013:9) who stated,

> "The display here contains a meaning that everything is still in abstract then it is concreted by using a tool so it can be reached with the simple mind and it can be seen, viewed and felt".

Next, the first thing to that the researcher do is provoking students knowledge by asking a few questions about comparing. After knowing each students ability. After that, doing a treatment which is a direct practice by using existing objects such as a pencil. The researcher takes a few of pencils randomly and divide it into two pieces then comparing the "a lot-a few" pencil with using a sign >, <, and =, it also applies to an object which is same as a ruler, book and eraser. The learning about comparing many objects is done at first and second meeting.

The result of the observation at first treatment, students' average is still in the phase of knowing the material so they always hard to pay attention the material that is delivered by the reseacher. In the learning process, students are active enough whether asking the question or answering the question which is given. From that learning process, students were not independent enough when they were doing the test because they keep asking what is the meaning of it to the reseacher. So the result that was given, it showed that students are not good enough to overcome the learning material that was delivered.

Next on the second treatment, students started to pay attention to the material that was delivered by the research passionately. In the learning process, students are quiet active whether asking or answering the question which was given because the material which is teached, is same as before eventhough it has been modificated a little bit so they couldn't be bored. After giving a treatment, the reseacher will give a test that they have to do it and they are quiet able to do it independently. For the result, it was increasing from before so it can be proved that students are able to overcome the material as well.

For the third meeting, the reseacher do a treatment about long-short thing using a pencil and a ruler. At this meeting, the reseacher and students do the comparing a long-short thing simply by using a pencil and a ruler that has different size of length so it will be easier to them to understand the long-short. The observation's result on the third treatment, shows that is an attention to the material which is delivered, is very good because students seem like the material. So, students are really active in asking and answering the questions. And, from the tests' result, which is given, shows an enchancement so it can be said that students overcome the learning material that is given.

It also applies to the fourth meeting that do the treatment about big-small thing using an eraser, a book, a table, chair, and white board which has a different size.The observation's result on the fourth treatment, is same as the last treatment before. The attention to the material which is delivered, is very good because students seem like the material. So, students are really active to ask and answer the question. And, from the result, it can be said that students overcome the learning mateial which is given.

For the fifth and sixth meeting are the meeting where the learnings from first meeting to fourth meeting are repeated in one discussion. It is about comparing many things, comparing a long-short thing and comparing a big-small thing. The observation's result on the fifth and sixth treatment, students were really pay attention to the material which was given because it was repeated from the last material before. In the learning process, students are really active to answer the question. So, when they were doing the test, they were able to do it independently. From the tests' result, it can be seen that students can overcome the material that was teached, very well.

In this research, it shows that the ability of comparing many things, a long-short thing and a big-small thing, has been increased a bit where the child was ble to do the comparison with a little help. The increasing of the ability of comparing in this research can't be separated from the treatment of repeated action and using of the object learning media around that have the characteristic of visualization that is easy to find and recognize so it will be easy for the reseacher to attract students' attention.

It is also supported by Lungit Satyajati's (2013) research which showed that there was a significant impact to students class II B's achievement at the mathematics' subject by using the concrete of object's media.

The deaf child has a trouble in understanding the abstract thing because of the limit of hearing especially in mathematics' subject which is hard to understand such as mathematcs' concept, hard to do the higher mathematics' concept, the study's interest is lower and the result for matehmatics is also lower. So, the deaf child has a lower achievement than the normal child. It is exactly preventing the development of child's cognitive especially in mathematic and of course in comparing. By using the object learning media around, it can teach the child about comparing by using visualization the concrete thing so that "abstract" mathematic can be understood by the child and the repeated material also can optimalize the ability of comparing that is owned by child. Because the media, according tob Hamidjojo (In Arsyada, 2013:4) that,

> "A media is a whole intermediate form that is used by the human to deliver or spread an idea, thought, or opinion so that idea, thought, or opinion which is shown, can reach the intended recipient".

So, the using of learning media as a support in learning process is precisely used especially in mathematics learning which needs a media to be a place to concretize the existing material. As a media that is easy to find and recognize for the child in around the school's environment, it can be changed with another media as long as it suitable with the child's characteristic.

According to the statement at the top, it can be concluded that there is a significant impact from using the object learning media around the child of the ability of comparing in mathematics learning for deaf students Class II at SLB Asih Mulya Pamekasan

Recommendation

According to the research of the impact of using the object learning media around the child to the ability of comparing in mathematics learning, it can be suggested that :

1. For Teachers

   It can be expected for the teacher to be more creative in using the object learning media around the child to train the ability of comparing many things, a long-short thing, and a big-small thing.

2. For Parents

   For parents, it will be better if you want to continue about the material that has given at the school so the ability of comparing especially comparing many things, a long-short thing, and a big-small thing can increase significantly.

3. For Next Reseacher

   This research's result can be used to be a reference material of using the object learning media around the child with more big research's scale and different subject of the research.

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Effects of 5s Activities in Surat Thani Municipal Office, Surat Thani District, Surat Thani Province

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Abstract

The purposes of this qualitative research was to 1) to investigate effects of 5s activities in Surat Thani Municipal Office, Surat Thani District, Surat Thani Province, and 2) to explore the problems and obstacles of 5S activities in the Surat Thani municipal office. The informants were divided into two groups that consisted of a group of 10 municipality executives and a group of 10 municipality employees.

Research findings showed that 1) 5S activities in the Surat Thani municipal office were unsuccessful, and 2) the failure was caused by four factors such as; in management, executives of the municipality did not apply the management theory to the implementation of 5S activities, in knowledge and understanding, most of the executives did not have proper knowledge and understanding of the meanings and procedures of 5S activities, in participation, the executives formulated the policy on 5S activities without consulting the employees or asking for their opinions, in teamwork, there was no exact area designated and no team of responsible employees was assigned.

Keywords: *5s Activities, Municipal Office, Surat Thani Province*

1.Introduction

Surat Thani Municipality Located in Amphoe Mueang. Surat Thani The city's central business district. Originally a community located in the Market District. Formed a sanitary rule later in 1932 has changed. The regime from the monarchy to the democratic regime. It has been enacted. Municipal regulations Act 2476 B.E., which resulted in the sanitation of the city of Surat Thani. Was raised as a municipality of Surat Thani on December 7, 2478 B.E.

Subsequently, on April 19, 2007, the Minister of Interior Signed in the Announcement of the Ministry of Interior dated 19 April 2007 on changing the status of the municipality of Surat Thani. Is a municipality of Surat Thani Effective May 4, 2007. Surat Thani Municipality Office has the authority and duty to: 1) Solve problems such as traffic, garbage, floods, etc; 2) Raise Surat Thani as the economic center of the upper southern region; 3) Increase the quality of life and the future better; and 4) glorification of art, culture, religion and sport (Surat Thani Municipality Office, n.d.).

The concept of 5S activities, even if it is more than 20 years old, is not considered obsolete because of the continuity of the past 5S activities in Thailand. To date, there have been successful agencies, suffered a failure, and agencies are still trying to achieve. As well as the agencies that are starting to do such activities in the agency, it is always a confirmation of the importance and acceptance of the standards of the 5S activities.

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The Senate Secretariat (2011, p. 1) states that 5S activities mean organizing. And improve their workplace or work environment and their work. To create an environment good work, safe, orderly, quality and efficiency.

As a basis for increasing productivity There are five 5S activities: 1) Sort (Seiri): Make work easier by eliminating obstacles; Reduce chances of being disturbed with unnecessary items; Remove all parts or tools that are not in use; 2) Set In Order (Seiton): Arrange all necessary items so that they can be easily selected for use; Prevent loss and waste of time by arranging work station in such a way that all tooling / equipment is in close proximity; 3) Sanitation (Seiso): Clean your workplace on daily basis completely or set cleaning frequency time to time; Keep workplace safe and easy to work; 4) Standardize (Seiketsu): Standardize the best in the work area; Everything in its right place; 5) Sustain (Shitsuke): Not harmful to anyone; Training and discipline; Training is goal-oriented process. Its result feedback is necessary monthly.

Surat Thani Municipality started to implement 5S activities, although it was ready in all aspects. But it has not been successful for less than a year. The results indicate that The 5S activities of all agencies in the Surat Thani Municipality Office have not passed the benchmark. Municipal employees perform only clear procedures (Seiri) and clean procedures (Seiso). For this reason, I am interested to study and implement the study to develop and improve the 5 S activities in the Surat Thani Municipality Office to succeed.

2.Objectives

1.To investigate the effects of 5s activities in Surat Thani, Surat Thani Province, Surat Thani Province

2.To explore the problems and obstacles of 5S activities in the Surat Thani municipal office.

3.Research Design

This study uses qualitative research methods. The data was gathered and analyzed as follows:

1) Unit of analysis Surat Thani Municipality Office that consists of 4 office divisions and 3 divisions.

2) Population and sampling The informants were divided into two groups which consisted of a group of 10 municipality executives and a group of 10 municipality employees. Surat Thani Municipality administrators consist of Mayor, Deputy Mayor, Municipality Mayor, Director, Office of the Director, and Head of the Bureau. Employees of Surat Thani Municipality level of operation consisted of the Chief Administrative Officer of the Chief Administrative Office of the Division.

3) Tools used to collect data in this study, semi-structured interviews were used. In depth interview in this interview, the interviewer has set the topic of interview topic according to the purpose of the study.

4) Inspection and data analysis the inspection is to prove a reliability whether the obtained results is corrected or not by utilizing data triangulation to prove whether the obtained data is correct or not (Babbie, E., 2010). The methods are to inspect data source from personal source, time source and place source in order to inspect whether the obtained data are identical and reliable or not. As for the data analysis, the researcher utilized content analysis in data analysis by utilizing ideal framework considered from the review of literature to be a guideline in data analysis.

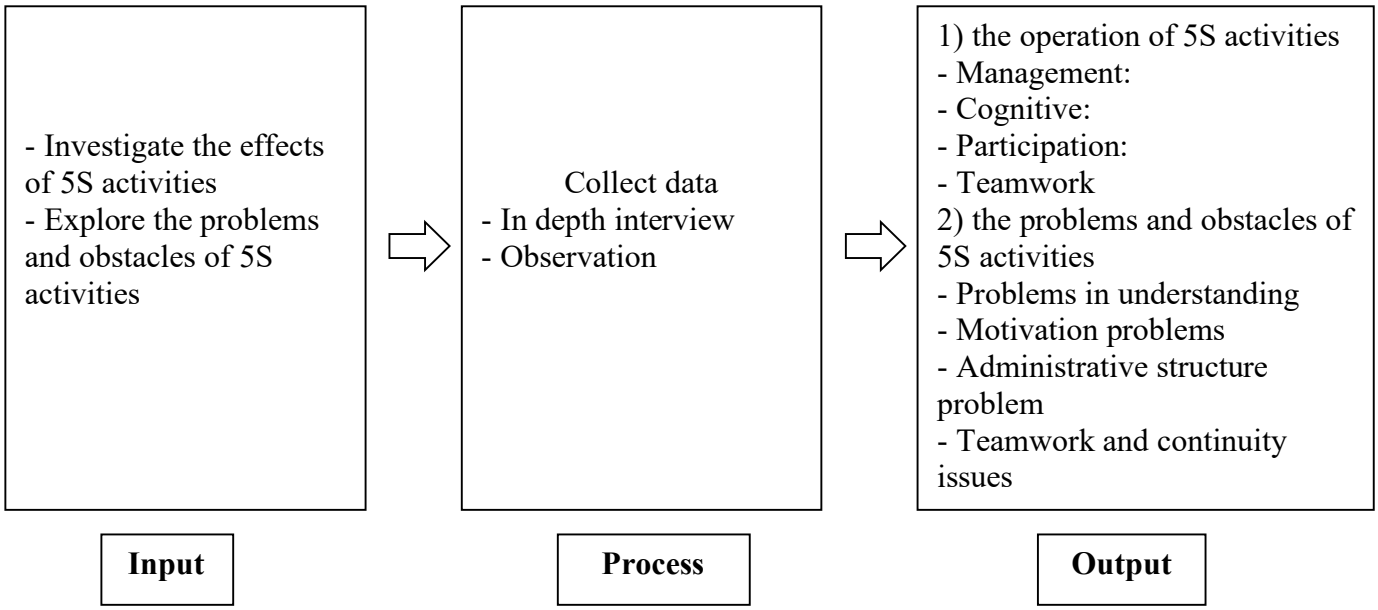

Figure 1. Idea framework of the research

Figure 2. Logo of Surat Thani Municipality Office

Figure 3. Surat Thani Municipality administrators

Figure 4. Surat Thani Municipality Office

4. Results

The results of the study according to the first objective, it was found that the operation of 5S activities in the office of Surat Thani Municipality is divided into 4 issues as follows:

1) Management: Prepare before the operation. 5S Management does not plan or. Prepare personnel, budget, place to accommodate changes when the policy is set, but the command. As a result, municipal employees conduct activities without knowledge. During the 5S activities, lack of monitoring and evaluation in each office was not set. The internal audit committee is lack of supervision from the management. In addition, there is a problem with the budget. The expenses for the activities are not budgeted.

2) Cognitive: The administrators and the municipal staff have knowledge of the 5S activities. They do not know all the details of Sort (Seiri) and Sanitation (Seiso). own

3) Participation: The 5S activities of the municipality. The executives form the policy, procedures and procedures of the municipal staff. However, no meeting or consultation. Discuss between administrators and practitioners alike, so that suggestions for improvement will be made. 5S activities, each other, although some are responsible.

4) Teamwork: The municipality did not set up a clear team or set up a responsible team during the 5S activities. The department never organized meetings, exchanges, experiences, problems and obstacles.

The results of the study were as follows: Surat Thani Municipality faced the following obstacles:

1) Problems in understanding 5S activities: Surat Thani Municipality has never organized training to educate workers about 5S activities. Most of them do not have knowledge. When management has a policy. To carry out the 5S activities, it was completed. Therefore lack of integration of knowledge.

2) Motivation problems in the activities: Surat Thani Municipality administrators did not. Set measures for you to punish those who intentionally or punish neglected practitioners. Make a practitioner I rarely cooperate and feel that. If you do not do it, do not worry. Spend time doing something else better.

3) Administrative structure problem: The municipal administration structure is the vertical supervisory line. Divide departments into divisions and divisions. It is not consistent with the 5S activities, and there is no budget for the 5S activities. The larger municipality has

a mission to do and to solve many people's problems; administrators and practitioners do not have time for 5S activities.

4. Teamwork and continuity issues: The 5S activities do not have a definite ending period. But it is a continuous activity. Work together as a team and do it every day.

5.Conclusion and Discussion

1) Management factors affect the 5S activities of the Surat Thani Municipality Office because the activities were not successful. Because it is a set. Policy and order But not taken seriously by lack of planning. Implementation of the plan to practice. Performance Monitoring and improvements to make Improved implementation of activities. This is in line with Ho's research (1999). The 5S activities were developed as a TQM system in Hong Kong, Malaysia and the United Kingdom. The results show that 5S activities have been developed as TQM systems to the standard of responsibility for accident reduction. Ho Safety Suggestions that organizations should adopt this guideline are key policies that need to be followed and evolve to address the quality of the organization.

2) The cognitive and managerial factors affecting 5S activities of the Surat Thani Municipality Office. Because management is not aware of the 5S activities, it should not be provided training to educate municipal employees. Before the practice It is expected that the municipality employees will go to self-study. The reality most municipality employees did not study. Each unit is not primary, or the same standard practice makes the activity successful. This is in line with the research of Phuphong Phurri (2010). Study on the development of 5S activities of Piboon Mangsahan Municipality. Ubon Ratchathani The study indicated that 5S Activities of Pibulsongsan Municipality Most policies have been announced for 5S activities. Understand and educate about 5S training. The 5S Board has been appointed. The problem of 5S activities is mainly a problem with lack of knowledge workers. Understanding of 5S activities cannot be adjusted to the paradigm of working with management because of lack of co-thinking, planning, and performance. The development of the 5S activities mainly see that. There should be restoration of 5S activities, exhibitions, 5S activities, field trips, The 5S activities contest are important if you do not have the training to understand it before it can interfere with the activity.

3) Participatory factors affect 5S activities of Surat Thani Municipality Office. There is no sense of being 5S activities. Including rules, rules, and evaluation criteria. The municipality employees are not involved in the management activities. This is consistent with Warwood, & Knowles, (2004) 's research on interest in factory participation in 5S activities in Japan. The involvement of all the staff, the management, the staff who have been trained as the 5S Practice Committee, the participation has been a successful concept, coupled with the 5S activities.

4) Teamwork factors affect the 5S activities of the Surat Thani Municipality Office because there is no defined area. No person or group is defined. The team responsible for each area. But take the approach to everyone responsible in the area around the table. Own cabinet Cause a centralized work. No relationship, no consultation. This is in line with Sui-Pheng & Khoo's (2001) study of successful management in Japan with 5S activities. Management with 5S activities brings success to the organization and employee responsibility.

6.Suggestions

A. Operational Suggestion

1) The Deming Cycle should be applied to the 5S activities, which has 4 steps: Plan Do Check Act for continuity activities.

2) There should be a dedicated budget for 5S activities and a committee for the administration of this project, representing all municipal agencies. To be systematic and more effective.

3) Employees should be encouraged to comment on the 5S activities, including planning, procedures, procedures, and evaluation.

4) The duties and responsibilities should be clearly defined. There is a contest for awards for 5S events.

5) Provide training on knowledge of 5S activities to all personnel before implementation and Manage training review at least once a year.

6) The 5S activities manual should be provided to executives and practitioners. In order to learn, the activities can be carried out in the same way.

7) It should bring advanced information technology to use with 5S activities to learn.

B. Suggestions for the Next Research

1) Quantitative and qualitative research should be conducted in the implementation of 5S activities to obtain deeper and deeper information.

2) Experimental research should be conducted by applying the TQM system to the municipal office.

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Bio data

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Enhancing Problem Solving Through Mathematical Prompts

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Abstract

The purpose of this study was to develop mathematical prompt that would enhance the performance of the Grade 8 students in problem solving. In the performance of the students in problem solving, there were significant improvements to the students which belong to the upper and lower group with mathematical prompts than those without mathematical prompts. In addition, based from the result of the mean gain score, both upper group with mathematical prompts and lower group with mathematical prompts got a higher mean gain score compared to both upper group without mathematical prompts and lower group without mathematical prompts. But, the upper group with mathematical prompts has a higher mean gain score than the lower group with mathematical prompts. This implies that mathematical prompts were more benefited to the upper group. Moreover, the perceptions of the students and in-service teachers also highlighted the positive feedback in the use of mathematical prompts in problem solving.

Keywords: *Mathematical Prompts, K to 12 Basic Education Curriculum, Problem Solving*

INTRODUCTION

One of the twin goals of the K to 12 Basic Education Curriculum in Mathematics is the problem solving skill. Mathematical problem solving is finding a way around a difficulty, an obstacle, and solution to a problem. It involves students in applying the four processes: Reasoning, Communicating, Connections, and Representation. In addition, Problem solving provides students the opportunities to apply content knowledge in the areas of Number and Operations, Algebra, Geometry, Measurement, and Data Analysis and Probability. Hence, it provides a window into children's mathematical thinking and a major vehicle for assessment.

Mathematical prompts are guide questions or statements that assist the students in the process of problem solving. According to Anderson and others (2011), mathematical prompts develop positive response from the teaching learning process.

In line with this, the researcher developed activities that provide mathematical prompts as scaffold in problem solving.

STATEMENT OF THE PROBLEM

This study aimed to help the Grade 8 students improve their performances in problem solving on systems of linear equations in two variables. Specifically, it sought to answer the following questions:

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1. Determine the performances of the students in problem solving with or without mathematical prompts among:
    a. upper group
    b. lower group
2. Compare the performances of the students with mathematical prompts or without mathematical prompts in problem solving among:
    a. upper group
    b. lower group
3. Determine the students' perceptions on the use of mathematical prompts in problem solving.

CONCEPTUAL FRAMEWORK

This study used three major variables of the conceptual framework, namely: 1) Identification of students' performance in problem solving involving Systems of Linear Equations in Two Variables; 2) Development of the Mathematical Prompts in Problem Solving involving Systems of Linear Equations in Two Variables; and 3) Performance of the students in problem solving with or without mathematical prompts among upper group and lower group (see Figure 1).

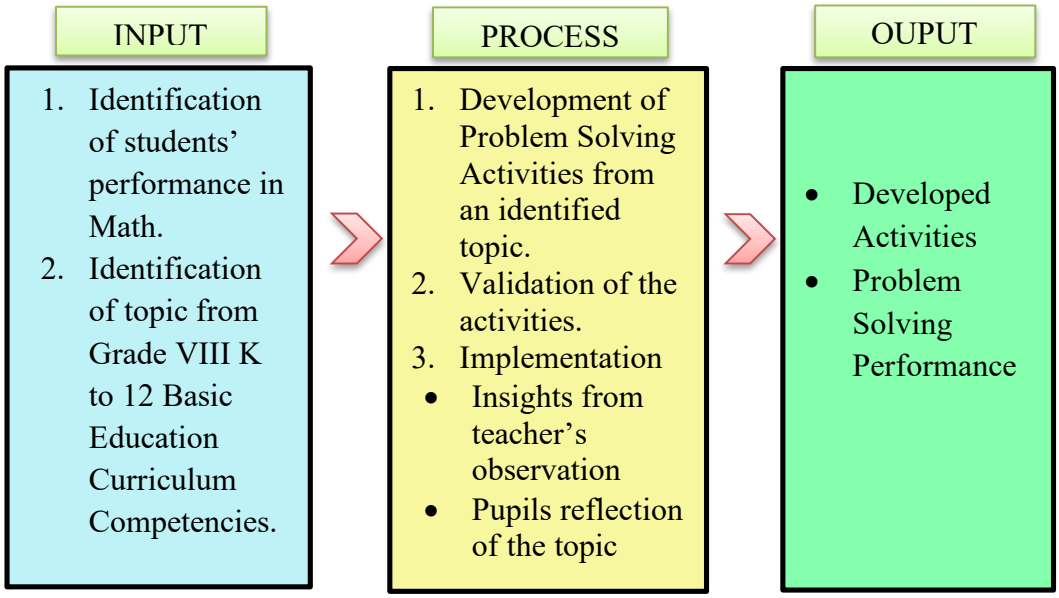

Figure 1. Conceptual Framework of the Study

SCOPE AND LIMITATION OF THE STUDY

This study was limited to three sets of developed word problems with mathematical prompts which were found interesting from the Grade 8 K to 2 Basic Education Curricular Modules. The learning topic focused on the enhancement of problem solving that involved a system of linear equations in two variables through mathematical prompts. There were originally six (6) sets of word problems with mathematical prompts yet, reduced into three (3) sets as a result in the conducted pilot testing and the evaluation of the Mathematics Education experts.

REVIEW OF RELATED LITERATURE

Problem solving is one of the many topics in mathematics that students' usually struggles. Many researches were conducted related to problem solving on how to scaffold this

difficulty in mathematics. According to Ge and Land (2003), question prompts are effective in helping students to focus and monitor their learning. In line with this, this research used prompts to scaffold difficulty in problem solving.

Other related literatures on how to support and motivate the students' performance in problem solving were conducted. And most of these revealed that sharing and discussing of problems are helpful for the students improve their performance in problem solving. Furthermore, low achieving and high achieving students gained equally from practicing assistance in relation to problem solving. Prompts are effective assistance in problem solving that guides the students in the process.

Using prompts promotes positive response from the students as it develops understanding of scientific concepts. In addition, prompts help enhance students' performance.

The type of student that is more benefited on using prompts was not mention on the discussed related literature. Hence, the researcher conducted a study that will determine whether using mathematical prompts benefit more the students who belong to the upper group or the students who belong to the lower group, or both groups of students.

RESEARCH DESIGN AND METHODOLOGY

This study used quasi-experimental research design. Quantitative data in a form of an achievement test; pre-test and post-test; and problem solving activities while qualitative data in a form of a journal of the students. The word problems with mathematical prompts used for this research were validated by the Mathematics Education Experts and tested before implementing to the target respondents.

RESEARCH INSTRUMENTS

To generate the gathering of data, the researcher designed and developed self-made achievement test; pre-test and post-test questionnaires; problem solving activities with or without mathematical prompts, rubrics, Grade 8 Mathematics competencies, and reflection journal.

DATA GATHERING PROCEDURE

In developing the mathematical prompts, the researcher chose a topic from the Grade 8 mathematics competency under the K to 12 Basic Education Curriculum. And then, the researcher started organizing the instruments validated by Mathematics Education experts, face-validated by the adviser and piloted to select Grade 8 students. Before the implementation, revisions of the activities were done by integrating all the comments, suggestions of the mathematics education experts and the result of the pilot testing.

A letters were made addressed to the school principal and mathematics department head to conduct the research. An achievement test was made to evaluate the prior knowledge of the students with regards to problem solving involving systems of linear equations in two variables. Problem solving activities were also made to evaluate the performance of the students in problem solving which was support by the pre-test and post-test questions.

RESULTS AND DISCUSSIONS

Implementation of the Activity

Figure 1 shows the results of the pre-test and post-test scores of the students. Both students belongs to the upper and lower group with mathematical prompts performed better

than those of the students belong to the upper and lower group without mathematical prompts. This is supported by Pan and Yu (2014) that prompts helps the students enhance their academic performance as compare to without prompts.

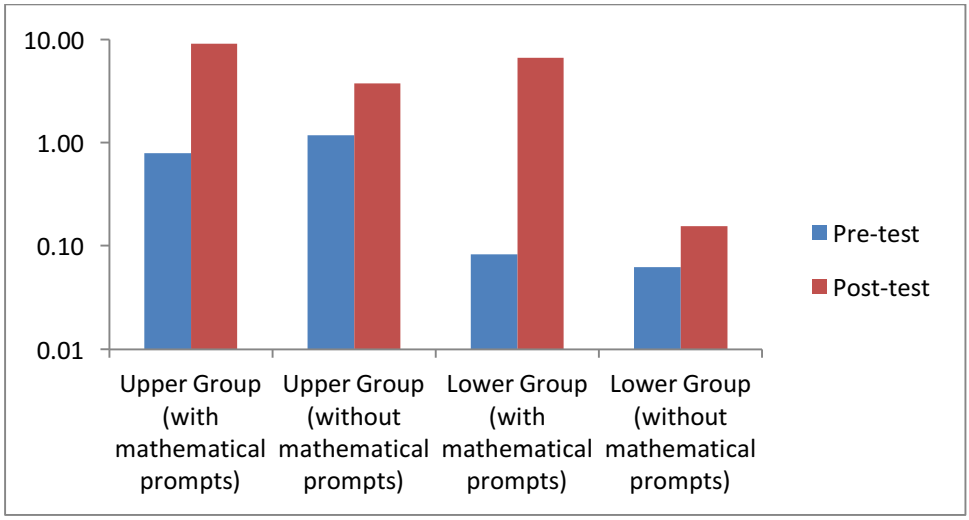

Figure 1. Mean Score in the Pre-test and Post-test

Performance of Respondents in the Pre-test and Post-test

Table 1 shows the comparison between the pre-test and post-test of the students with and without mathematical prompts. As shown in Table 1, using mathematical prompts among students in the upper group had higher improvements as compared to students without mathematical prompts.

Consequently, the p-value except the students belongs to the lower group without mathematical prompts was 0.00 which was less than α=0.05. This implies that there is significant difference between the pre-test and post-test of the students that belongs to the upper group, with or without mathematical prompts and students belongs to the lower group with mathematical prompts. But, based from the mean difference of the upper group with and without mathematical prompts, the upper group with mathematical prompts got a high mean difference compared to without mathematical prompts. In addition, the upper group with mathematical prompts has the higher mean difference than the lower group with mathematical prompts.

Table 1. Comparison of Pre-test and Post-test Scores between Groups

Groups		Mean		Mean Difference	Standard Deviation		t-value	p-value
		Pre-test	Post-test		Pre-test	Post-test		
Upper Group	With Mathematical Prompts	0.79	9.08	8.29	1.11	2.27	-21.06	0.00
	Without Mathematical Prompts	1.17	3.71	2.54	1.38	2.17	-6.22	0.00
Lower Group	With Mathematical Prompts	0.08	6.58	6.50	0.04	3.88	-8.33	0.00
	Without Mathematical Prompts	0.06	0.16	0.09	0.35	0.88	-0.55	0.59

Moreover, Table 2 shows that the p-value of both upper and lower groups with or without mathematical prompts in the gain score was less than α=0.05. Hence, based on the gain score of the students there is a significant difference between the students who belong to the upper group with mathematical prompts and students belong to the upper group without mathematical prompts. Similarly, there is a significant difference between the students who

belong to the lower group with mathematical prompts and students who belong to the lower group without mathematical prompts.

Table 2. Comparison of Mean Gain Score between Groups

Groups		Gain Score				
		Mean	Standard Deviation	Mean Difference	t-value	p-value
Upper Group	With Mathematical Prompts Without Mathematical Prompts	7.50 -0.71	3.37 1.09	8.21	15.02	0.00
Lower Group	With Mathematical Prompts Without Mathematical Prompts	3.80 -0.05	4.35 0.31	3.85	5.66	0.00

Students' Output in Problem Solving Activity

Every lesson done during the implementation of the study had corresponding problem solving activity to evaluate the understanding and performance of students on the given topic. Figure 2 reflects the mean score of the students in problem solving activities. It was shown in the figure that the overall mean score of the students belongs to the upper group with mathematical prompts was higher than those of the students belong to the upper group without mathematical prompts. Furthermore, students belong to the lower group with mathematical prompts had a higher mean also than those of the students belong to the lower group without mathematical prompts. Correlated to this result is the study of Anderson and others (2011) which examined the verbal prompts as a tutor that promotes reflection on students' response that revealed that prompts developed understanding of scientific concepts.

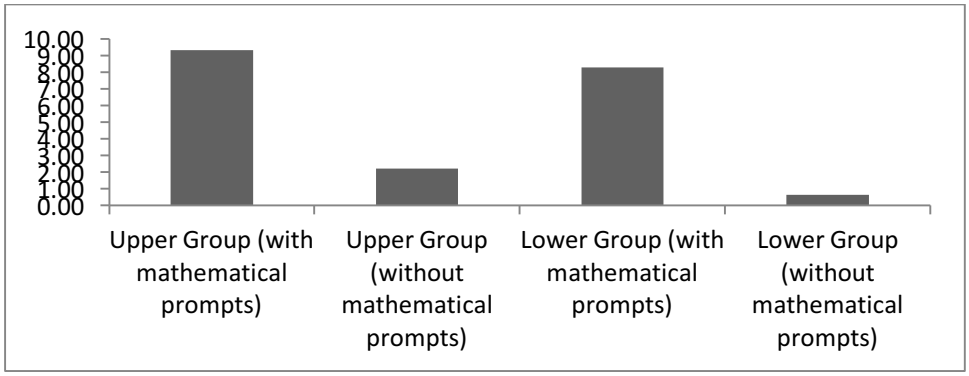

Figure 4. Mean Score of Students in the Problem Solving Activity

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary of Findings

The mathematical prompts were evaluated by the Mathematics Education experts as Excellent.

The mean pre-test performance of the upper group with mathematical prompts in problem solving involving systems of linear equations in two variables was 0.79 and their mean post-test performance was 9.05 while the pre-test performance of the upper group without mathematical prompts was 1.18 and their mean post-test was 3.78. This implied that there was a higher improvement on the performance of the upper group in problem solving through mathematical prompts based from their performance in the pre-test and post-test. In addition, the mean pre-test performance of the lower group with mathematical prompts in problem solving involving systems of linear equations in two variables was 0.11 and the mean post-test was 6.97 while the mean pre-test performance of the lower group without mathematical prompts was 0.06 and the mean post-test was 0.13. This showed a significant difference

between the performance of the lower group with mathematical prompts and without mathematical prompts.

Furthermore, these proved that problem solving through mathematical prompts enhanced the performance of the students. The mean diagnostics performance of the upper group with mathematical prompts in problem solving activity 1 was 7.98, in activity 2 was 4.78 and activity 3 was 4.55 while the mean diagnostic performance of the upper group without mathematical prompts in problem solving activity 1 was 6, in activity 2 was 2 and activity 3 was 0.24. In addition, the mean diagnostic performance of the lower group with mathematical prompts in problem solving activity 1 was 7.28, in activity 2 was 4.44 and activity 3 was 3.85 while the mean diagnostic performance of the lower group without mathematical prompts in problem solving activity 1 was 4.66, in activity 2 was 0.41 and activity 3 was 0.25. The results in the diagnostic test among the upper and lower groups with or without mathematical prompts showed that learners with mathematical prompts improved their performance in problem solving involving systems of linear equations in two variables.

Conclusions

From the given findings of the study, the following conclusions are drawn:

1. After the implementation, the students given mathematical prompts improved their performances as evident in the post-test scores. This means that students attained better understanding on problem solving involving systems of linear equations in two variables through mathematical prompts based from the pre-test and post-test results. Similarly, based from the mean gain scores of the students, both upper group and lower group provided with mathematical prompts got a higher mean gain score compared to the upper group without mathematical prompts and lower group without mathematical prompts. But the upper group with mathematical prompts has a higher mean gain score than the lower group with mathematical prompts. This implied that mathematical prompts were more benefited to the upper group.

2. There was an improvement in the performance of the students with mathematical prompts as evident in the scores on the problem solving activities.

3. The mathematical prompts generated positive perceptions both from the students and in-service teachers in math class. This implied that mathematical prompts helped the students to enhance their performance on problem solving involving systems of linear equations in two variables.

Recommendations

Based on the results and conclusions of the study, the use of mathematical prompts in problem solving involving systems of linear equations in two variables was recommended. In addition, the mathematical prompts guide the students in problem solving. However, it is also recommended that the prospective teacher-user:

1. consistently and progressively use mathematical prompts in aiding students perform better in problem solving activities in mathematics;

2. design more mathematical prompts that address the difficulties of students who belong to the lower group; and

3. similarly, design mathematical prompts that further promote the problem solving activities of the students belonging to the upper group, such as when giving difficult problems that can be optionally answered by more mathematically-endowed students who get bonus points for their efforts.

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Development System of English for Communication of Human Resources with Educational Technology and Communication for Business Organizations

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ABSTRACT

The objectives of this research were to develop the development system of English for communication of human resources with educational technology and communication for business organizations, and to evaluate the enhancement of developed development system of English for communication of human resources with educational technology and communication for business organizations to be practical. Mix method was applied to study the relevant researches and literature review, synthesized all information to create the research framework. Quantitative research method was applied to 717 executives and staff in business organizations, and 400 executives and staff in the firms registered with The Securities Exchange of Thailand. Qualitative research method with focus groups was used. Data was collected from 10 experts selected with purposive sampling based on the required qualification.

Findings showed that development system of English for communication of human resources with educational technology and communication for business organizations that had been evaluated the suitableness and feasibility, and was practical was in line with the goal of forming the achievement in English competency for the desirable communication in the future efficiently and effectively for the highest benefits of the higher educational institution, society and nation.

Key words: *Human resources development, Educational technology and communication, Business organizations*

INTRODUCTION

At present, business organization connects rapidly worldwide. English language, which is the international language is a key tool for communication. With this reason, one who knows English and applies it to communication shall have the benefits for self and business organization. Thus, learning English language is significant as it builds the good relationship in business to become successful. In order to do so, it is necessary to have

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learning method to foster the knowledge and capability, communication skills for confidence, and English language learning management to support the person to use English language to communicate. For the business organizations in Thailand, English language is considered the weakness comparing to the ASEAN countries such as Singapore, Malaysia, or Philippines. Learning English for communication would enhance the thinking and work performance creatively to develop personnel to have vision and confidence in business operation with English efficiently.

To build up business organization to become successful firmly and sustainably the development of English for communication competency is required (Ministry of Education, 2017). The advancement of educational technology and communication in various boundless forms, and the unlimited storage in a form of multimedia results in the utilization of electronic or digital media long-distance learning and e-learning and it becomes the new educational innovation used as the tool for learning management or activities to enhance personnel (Bray, Eric & Aoki, Kumiko & Dlugosh, Larry, 2008) through website in order to foster the competency in English for communication. The lessons are from the book, articles, information from presentation, and learning resources that are in the form of electronic that are consistent with the aim to foster the desirable skills in the future (Suphanne Chanprasert, 2013: 33) to apply to the personnel to be able to communicate in English in the future. This would help to increase the work quality and performance to the business organization. If considering the state of educational technology and communication that moves forward rapidly and the application in the business organization (Office of the Basic Education Commission, 2017), the development of English for communication curriculum through website is going to be the guideline for competency enhancement in English for communication of the individual as everyone is able to access the lesson via the tools at any time. This is the new move of the learning in the business organization at present and in the future (Chawanida Suwanich, 2012: 41).

Currently, English for business curriculum through website to enhance English competency for communication is implemented widely since it can access to the visual, text, audio, picture, and motion pictures information or via internet through 3G-4G technology in order to access information technology all the time (Office of Online Education, 2017). With this reason, the personnel can very well access via e-Learning, which is the d-Learning approach that will become the most important method in the future (Office of the National Economics and Social Development Board, 2017). Moreover, it is the management of learning, content, and lesson through electronic media in various forms (Electronic Learning Center, Ramkhamhaeng University, 2017). Learning outcome will be the integration of information that the educational communication network growth ratio is 200% and the supportive program increases 1,000%. Further, the price in the future will be cheaper while the efficiency and effectiveness will increase.

The development of personnel to enhance English for communication competency through educational technology and communication is the key part of learning that encourages the motive in lifelong learning and will be able to set the new learning management base on the context suitable for self for the highest benefits (Stephan Böhm & Georges Philip Constantine, 2016). Learning management of the personnel in business organization lacks of effectiveness of educational innovation creation to change the self-management and obligation (Office of the Basic Education Commission, 2017) which will achieve the goal. Therefore, knowledge pursuing with new approaches such as learning through efficient learning web will lead to the quality human resources of the organization in the future (Aimee deNoyelles & Ryan Seilhamer, 2015). To implement the web to enhance the English for communication competency for success it comprises of knowledge and

content that increase skills and capability from the learning sources that can be retrieved the information for analysis and synthesis to form the accurate knowledge connecting to network worldwide appropriately. It is the crucial mechanism to achieve the purpose of experience and efficient English for communication skills enhancement.

From all mentioned above about significance and necessity of the development system of English for communication of human resources with educational technology and communication for business organizations, it will surely become the educational innovation creation that is important in the future since the personnel has to implement it in the real working situation to dedicate to the organization, economic system, society, and nation.

RESEARCH OBJECTIVES

This research aimed to develop the development system of English for communication of human resources with educational technology and communication for business organizations, and evaluate the enhancement of development system of English for communication of human resources with educational technology and communication for business organizations.

RESEARCH FRAMEWORK

The study on "Development system of English for communication of human resources with educational technology and communication for business organizations" from the relevant literature comprised of 1) development system theory, 2) educational technology and communication for developing human resources, 3) human resources development with communicational technology and communication for business organization, and 4) English communication on listening and speaking, which was set as the research framework as shown in Figure 1.

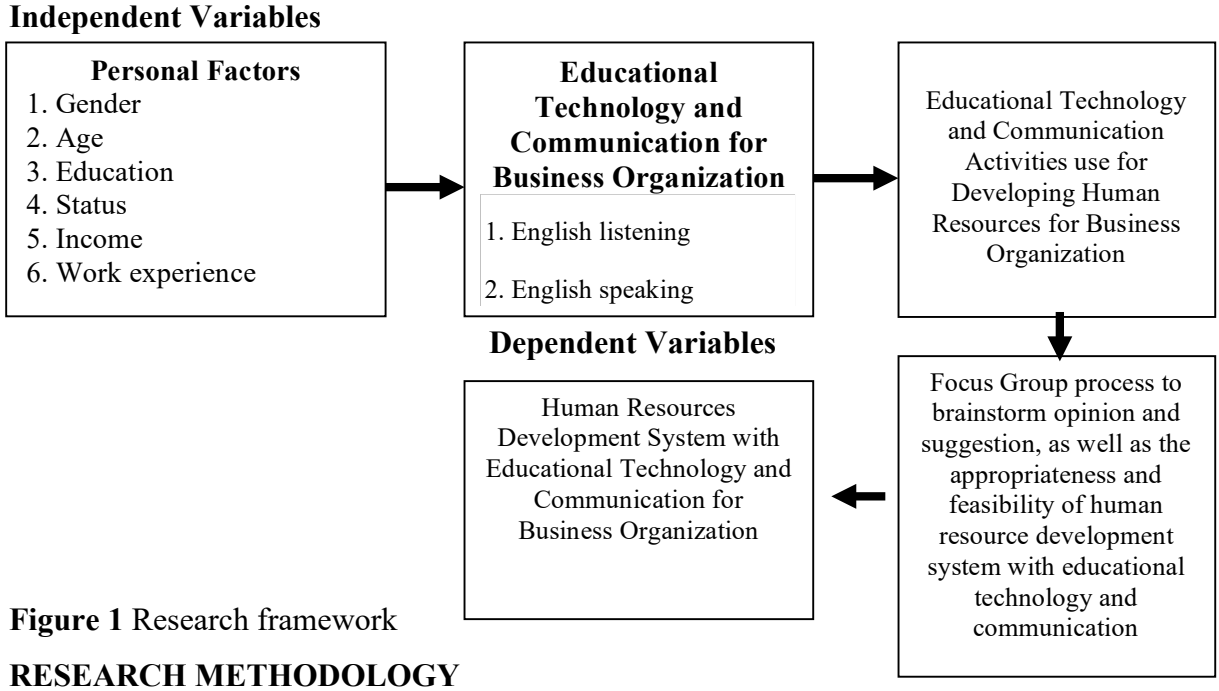

Figure 1 Research framework

RESEARCH METHODOLOGY

The research used mix method began with studied the documents, reviews relevant literature, synthesized the information to create the framework. Quantitative and qualitative research method was used by setting the focus group to examine and evaluate the development system of English for communication of human resources with educational technology and communication for business organizations. It was the technique that relied on the expert who brainstormed and provided the suggestions, including the appropriateness and feasibility of the future vision whether it would happen or not in the operation to gain knowledge and fact, and findings that would answer the research objectives as the following details.

1. Quantitative research

1.1 Population was 250,000 executives and staff in the 717 business organizations that registered with The Securities Exchange of Thailand in 2016. The sample group was calculated the size using Taro Yamane (1973) reliability level at 95% and error less than 5% to obtain 400 persons. Simple random sampling was applied to obtain the required number.

1.2 Reserch tool was the 5-rating scale questionnaire on the opinion on the level of significance of factors relevant to the development system of English for communication for human resources using educational technology and communication for business organization and find the reliability to validate the construct validity of the created tool.

1.3 The researcher collected data by coordinating with the sample group to make appointment and distribute the questionnaire via post to 400 participants.

1.4 Validated tool quality by testing the validity and reliability of the questionnaire for revision for more appropriateness and clearness which were 1) verified the quality of content validity by giving to five experts to find the Index of Item-Objective Congruence (IOC), and (2) tested the validity or the consistency with the Cronbach's Apha Coefficient. Test result showed that the result of all sections was .70, which proved the reliability.

1.5 Statistics used to analyze data were percentage, frequency distribution, and significance level of factors related to development system of English for communication of human resources with educational technology and communication for business organizations by finding the mean and standard deviation with statistical significance at 0.05 level.

2. Qualitative research

The researcher applied focus group to the group of experts comprised with 10 executives of business, executives of relevant government agencies, scholars holding position of Head of Department, President of institution or NGO. Conversation was recorded and noted. The data was analyzed and interpreted with content analysis. The research result was classified into the aspect followed the process of 1) setting the scope of the situation of development system of English for communication of human resources with educational technology and communication for business organizations to cover the research framework, 2) brainstorming by the experts and summarizing the aspects, 3) identifying the possibility of force towards social, technology, economic, environmental and political aspect that might completely change the situation or the ongoing trend, and 4) connecting and applying the situation as the background of the tentative future and applying the focus group result as the important information to summarize the research.

ANALYSIS RESULT AND CONCLUSION

In order to find the knowledge to answer the research objective to develop and evaluate the development system of English for communication of human resources with educational technology and communication for business organizations the researcher began with the analysis result of statistic data relating to the factor affecting development system of English for communication of human resources with educational technology and communication for business organizations by finding the mean and standard deviation using for measure the current actual and expected competency level on English communication of the personnel in business organization, as shown in Table 1 and 2.

Table 1: Mean and standard deviation of current actual competency in English communication of personnel in business organization

Items	Mean	Standard Deviation	Rank
English Listening			
1. Knowledge	3.87	0.568	1
2. Skills	3.82	0.601	2
3. Behavior	3.79	0.713	3
English Speaking			
1. Knowledge	3.91	0.639	1
2. Skills	3.88	0.591	2
3. Behavior	3.83	0.628	3

From Table 1, mean and standard deviation of current actual competency in English communication of the personnel in business organization sorting by the significance showed as follows.

English Listening
1st rank – Knowledge, mean 3.87
2nd rank – Skills, mean 3.88
3rd rank – Behavior, mean 3.79
English Speaking
1st rank – Knowledge, mean 3.91
2nd rank – Skills, mean 3.88
3rd rank – Behavior, mean 3.83

Table 2 Mean and standard deviation of expected competency in English communication of personnel in business organization

Items	Mean	Standard Deviation	Rank
English Listening			
1. Knowledge	3.98	0.634	2
2. Skills	4.03	0.573	1
3. Behavior	3.95	0.615	3
English Speaking			
1. Knowledge	3.97	0.709	2
2. Skills	4.12	0.692	1
3. Behavior	3.91	0.655	3

From Table 2, mean and standard deviation of expected competency in English communication of the personnel in business organization sorting by the significance showed as follows.

English Listening
1st rank – Knowledge, mean 3.98
2nd rank – Skills, mean 4.03
3rd rank – Behavior, mean 3.95
English Speaking
1st rank – Knowledge, mean 3.97
2nd rank – Skills, mean 4.12
3rd rank – Behavior, mean 3.95

From Table 1 and 2, it was found that the current actual and expected competency in English communication of the personnel in business organization was in high level of all aspects. Regarding knowledge, the personnel had knowledge of grammar or social structure, knowledge to convey meaning, knowledge of using teaching to convey the meaning, knowing the vocabularies that they understood the meaning, pronounced and listened accurately. Regarding skills, the personnel was able to interpret the meaning, use English vocabularies, form new words to communicate, use simple words, use replacing words, use language according to social norm, respond to personnel to know the aim of language learning and practicing, perform activities using language similar to the daily use, frequently use language, have opportunity to perform various activities as much as they can, pronounce to speak in sentence, be active and have rhythm and pitch based on context and situation, and have capability of using language as appropriate to society. Regarding behavior, the personnel developed the learning activities, had the development of roles in business organizations, and the instructor developed the supportive teaching system, the development of learning process that enhance the personnel to become skillful. The teaching used the most practical language, encouraged and promoted the opportunity to the personnel to take part in activity. The personnel applied innovations to teaching and learning, designed the various and interesting listening activities, and set learning plan, performance evaluation. Further, the personnel applied teaching language practice with other personnel in the organization, cognitive code learning, and total physical response. It encouraged the personnel to have learning motivation.

Table 3 Mean and standard deviation of evaluation on the appropriateness of the development system of English for communication of human resources with educational technology and communication for business organizations

Items	Mean	Standard Deviation	Rank
English Listening			
1. Knowledge	4.23	0.628	1
2. Skills	4.20	0.594	2
3. Behavior	4.18	0.579	3
English Speaking			
1. Knowledge	4.02	0.529	1
2. Skills	3.97	0.641	2
3. Behavior	3.95	0.583	3

From Table 3, mean and standard deviation of evaluation on the appropriateness of the development system of English for communication of human resources with educational technology and communication for business organizations sorting by the significance showed as follows.

English Listening
1st rank – Knowledge, mean 4.23
2nd rank – Skills, mean 4.20
3rd rank – Behavior, mean 4.18
English Speaking
1st rank – Knowledge, mean 4.02
2nd rank – Skills, mean 3.97
3rd rank – Behavior, mean 3.95

Table 4 Mean and standard deviation of evaluation on the feasibility of the development system of English for communication of human resources with educational technology and communication for business organizations

Items	Mean	Standard Deviation	Rank
English Listening			
1. Knowledge	3.98	0.604	1
2. Skills	3.92	0.582	2
3. Behavior	3.89	0.723	3
English Speaking			
1. Knowledge	3.92	0.607	1

2. Skills	3.91	0.594	2
3. Behavior	3.86	0.614	3

From Table 4, mean and standard deviation of evaluation on the feasibility of the development system of English for communication of human resources with educational technology and communication for business organizations in overall sorting by the significance showed as follows.

English Listening
1st rank – Knowledge, mean 3.98
2nd rank – Skills, mean 3.92
3rd rank – Behavior, mean 3.89
English Speaking
1st rank – Knowledge, mean 3.92
2nd rank – Skills, mean 3.91
3rd rank – Behavior, mean 3.86

From Table 3 and 4, it was found that the evaluation of appropriateness of feasibility of the development system of English for communication of human resources with educational technology and communication for business organizations of all aspect was in high level. It implied that it was well practical in the business organization to enhance the competency in English for communication. It helped to link the knowledge and understanding appropriately and be able to utilize for the highest benefits for the business organization, which was a part to accelerate the economy and society, and enhance the competitiveness in international level. It was the key factor to upgrade the living standard of personnel which was the result of the advancement of technology, which was the significant strategy to develop the potential of personnel to apply the knowledge to improve business organization in the future. The use of web to enhance the competency in English for communication emphasized on personnel-centered to practice skills for self-development to pursue knowledge in the rapid changing world hoping to implement to the business organization for the highest benefits in economy to become competitive.

Development system of English for communication of human resources with educational technology and communication for business organizations comprises of the following components.

1. Business organization should prepare content of English for communication which was the part of curriculum, exercise, quiz, and multimedia file.
2. Personnel can access the content through website via browser, web browser or download the content via computer program.
3. Course management is classified into three levels: personnel, instructor and system admin who can access the system at any time from everywhere through internet which supports unlimited users and lessons.
4. Content management consists of tool for creating content which is applicable for text - based and streaming media.
5. Learning support system consists of tools for communication between personnel-instructor and personnel-personnel, which are Web board and Chat room which the data history is stored.

6. Equipment for enhancing competency in English for communication that connects to the program on WAP (Wireless Application Protocol) and specific program for teaching and learning.

7. Teaching and learning via web to enhance the competency in English for communication comprises of three components:

7.1 Content management and adjustment to suit the curriculum for English for communication through web provides, presents and delivers information for teaching and learning.

7.2 Corresponding component and timing for teaching and learning sets the components to link with the curriculum for English for communication to develop human resources through web to enhance English for communication to enhance the competency of English for communication such as pictures, video, audio file downloading aiming to arrange the learning at the real time.

7.3 Environment and information retrieval from the curriculum for English for communication emphasizing on the management, research and accessible channel to the information.

8. Knowledge Anywhere in teaching and learning through web to enhance the competency in English for communication comprises of:

8.1 Explanation such as explanation, lessons, manual, support and other necessary information to support and facilitate personnel.

8.2 Intelligent support engine such as technology, wireless network and software that functions to manage and arrange the lesson presentation, communication, following-up and evaluation, including other accessories to support the equipment that are related to the design of operation, mission or learning activities presenting to the personnel.

8.3 Content repository such as content, lessons, exercise and test as well as the knowledge to be transferred to personnel.

8.4 Interface such as interaction with personnel via equipment.

9. Data management system consists of file and folder management system that has space to store the lesson for self with wireless and internet management system.

Development system of English for communication of human resources with educational technology and communication for business organizations will be the guideline for the key integrated innovation in education leading to the success and the intellectual movement to strengthen the sustainable economics and competitiveness, which will result in the development of the country. Innovation of education reform for developing human resources to have high skills is the crucial factor. The development of curriculum of English for communication in international level for turning to become the high income country driving by intellectual innovation will become the force to drive the country according to the strategy for the sustainable development.

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ICT and Social Justice in South African Schools: An Analysis of the E-readiness of Teachers in the Motheo Education District

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Abstract

Countries across the globe have put education as an apex priority. South Africa, like most countries participates in the global **'Education for All'** movement geared towards the advancement of social justice. Information Communications Technology (ICT) is used in schools as a means to ensure social justice. This paper provides an analysis of the e-readiness of teachers in integrating ICT in the Motheo Education District schools. The study predominantly looks at e-learning in advancing the three dimensions of social justice namely, inclusivity, relevance and democracy. A total of 142 teachers from 10 secondary schools in the Motheo Education District and three ICT Senior Education Specialists participated in this study. The researcher used designed a 5 point Likert scale questionnaire to collect data. The results revealed that teachers are aware of the importance of ICT and e-learning in schools, towards advancing social justice. However, they acknowledge that they have limitations and they are not ready in implementing it in their schools. The study concludes by offering a number of theoretical and practical recommendations for the e-readiness of teachers.

Keywords: *e-learning, e-readiness, information communications technology (ICT), social justice, South Africa*

1. INTRODUCTION

Changes in technology, the advent of computers, mobile technology and innovations in telecommunications technology have affected the way people live around the globe. Various sectors such as commerce, medicine, law, education etc., have been affected by the changes brought by Information Communications Technology (ICT). Again, social issues such as human rights, freedom of speech, poverty, inequality have forced social activists, governments, scholars etc., to explore the role of ICT in education in relation to social justice (Vrasidas, Zembylas, Glass,2009). There is, recently, an increased interest in researching the use of ICT in education for advancing social justice.

Although scholars and researchers differ in sentiments regarding the use of ICT in education, this study argues that if correct and systematically. The integration of ICT in learning environments like schools, have the potential to assist teachers to promote social justice. For instance, ICT assist teachers to promote social justice in issues like access to education, inclusive education, innovation and development in education, the promotion of multiculturalism, etc. (Tikly, Barrett, 2011; Banister, Reinhart, 2011 McKenzie, Kahonde, 2012).

In close relation to the above, it is upon the government with all its entities, to uphold this obligation for all its citizens by placing education as a cornerstone of social justice. That is

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why the fundamental responsibility of both the Department of Basic Education (DBE) and the Department of Higher Education and Training (DHET) is to provide quality education to all sectors of education in South Africa. Government, through the two education departments, must use education to ensure that people are not discriminated against, nor their welfare and well-being prejudiced or disadvantaged on the basis of gender, religion, political affiliation, race, age, disability, and location. (RSA, 1997; DBE, 2011). These are all social justice issues that government must promote through e-government, e-education, e-learning, m-learning, etc. (DBE,2011)

Based on the above, Department of Basic Education (DBE) developed a strategic document entitled, *Action to Plan 2014: Towards the Realisation of Schooling 2025*.From this document there was a shift of emphasis and there were new priorities which influenced the SA National Development Plan (NDP). These developments forced government to look into new priorities and this gave birth to the *Action Plan to 2019: Towards the Realisation of Schooling 2030.*

The Plan to 2019 has prioritised five strategic goals and among them, relevant to this paper, is Goal 16, Goal 20 and Goal 22, and they are read as:

Goal16 *- Improve the professionalism, teaching skills, subject knowledge and computer literacy of teachers throughout their entire career* (DBE, 2015).

Goal 20 *– Increase access amongst learners to a wide range of media, including computers, which enrich their education.* (DBE, 2015).

Goal 22 *– Improve parent and community participation in governance of schools, partly by improving access to important information via e-Education.* (DBE, 2015).

This paper reviews literature on quality education, social justice and how ICT can be infused in the 21st century classroom. The study looks at the e-readiness of teachers, by answering questions like: (1) Do teachers realise the importance of ICT in advancing social justice in education?; (2) What are teachers' perceptions on the use of ICT in improving their teaching and learning?;(3)What types of ICT resources are mostly used by teachers in their classrooms?; (4) What challenges do teachers face in integrating ICT in their classrooms?. The paper collects data using a questionnaire and present recommendations based on the literature review.

2. LITERATURE REVIEW

2.1 Understanding social justice in education

Education quality is a political mandate and hence a social justice issue. Social justice in relation to education quality can be drawn from the theories of both Martha Nussbaum's and Amartya Sen's capabilities approach to social justice and also Nancy Fraser's three-dimensional theory of social justice.

Nussbaum's capability approach is not only about the provision of free, equal, and independent education but also as an account of core human entitlements that should be respected and implemented by the governments of all nations, as a bare minimum of what respect for human dignity requires. (Nussbaum,2006). Capabilities approach argues that people are not the same as a result of this, the rights to the disabled should also be taken into consideration when quality education is provided.

Capability approach according to Sen, shares much with that of Nussbaum, but also differs in important ways. The work of Sen focuses on comparative decisions on social justice in a world with limited choices. This simply means that sometimes people are not presented with the same resources or different countries do not have the same resources and this impact on social justice (Sen, 2002). According to Sen "the main hope of our harmony in our troubled world lies in the plurality of our identities, which cut across each other and work against sharp divisions around one single hardened line of vehement division that allegedly cannot be resisted. Our shared humanity gets challenged when our differences are narrowed into one devised system of uniquely powerful categorization" (Sen, 2007, pp.16-17)

Nancy Fraser's approach on the other side draws attention to three dimensions to social justice namely, redistribution, recognition and participation (Fraser, 2003, Tikly, Barrett, 2011). Fraser's theory of social justice firstly had two dimensions i.e. redistribution and recognition and with those she argued that "without reducing either dimension to the other, it encompasses both of them within a broader overarching framework" (Fraser,2003, p. 35). The advent of technology and the context of globalization that was broad about by the internet influenced Fraser to come up with the third dimension i.e. participation. In this sense, Fraser refers to social justice in terms of 'participatory parity' (Fraser, 2007).

In the context of this paper redistribution relates to access to education in general and access to resources which according to quality education is the access to the use of different teaching and learning resources and the ability of teachers to have good classroom management. Recognition on the other side refers to identifying and then the acknowledgement of historically marginalised groups including rural communities, the disabled, vulnerable children, orphans of the victims of HIV/AIDS, etc. Recognition also refers to the use of education as an emancipator mechanism for the marginalised groups. Participation means the rights of individuals to have their voices to be heard irrespective of their geographic location, minority, disability, etc. Participation encourages people to become citizens of the global communities. (Fraser, 2007; Tikly, Barrett, 2011, UNISEF, 2009).

2.1.1 The inclusive dimension of social justice

The right to access to education is the first important goal adopted by governments globally. This goal provides every child with the right to education on the bases of equality of opportunities and without discrimination on any groups. So to achieve this, education must be available, accessible and inclusive to all children (UNESCO, 2007). The inclusive dimension of social justice approach to quality education deals with access that different individuals and groups have to education. It seeks to provide education to all even the marginalized groups (Tikly, Barrett, 2011, UNESCO, 2007). The marginalized groups of the societies are often referred to as the disabled, female, people in rural disadvantaged areas, etc.

Again, inclusive education is about the restructuring of education cultures, policies and practices so that they can respond to a diverse range of learners. This diverse range should include males and females, disabled and non-disabled, learners from different ethnic, language, religious or financial backgrounds. By this inclusive education must not be seen as only to focus on disabled learners within the mainstream education (EENET, 1998).

The redistribution dimension of inclusive education

The inclusive education is concerned with the achievement of social justice through the redistribution and recognition dimensions (Tikly, Barrett, 2011; Fraser, 2007). The redistribution dimension deals with how resources are distributed to accommodate different kinds of learners. The 21st century inclusive education teaching and learning requires the provision of schools with, among others, textbooks; computers, overhead projectors, interactive white boards, access to the internet, iPads, smart phones, etc. (Banister, Reinhart, 2011). This will ensure that all learners regardless of their abilities and disabilities are well catered for. Looking at the above mentioned resources one realises that most of them are ICT characterized. Therefore, the use of ICT resources is dominant within the 21st century schools. The redistribution of ICT resources is a social justice matter because the use of different ICT resources ensures the accommodation of the marginalized groups of the societies within the mainstream education system. ICT resources provide different users with auditory, visual, audio visual, 3-dimensional ways of communicating the message (Banister, Reinhart, 2011; Dalton, McKenzie, Kahonde, 2012).

The recognition dimension of inclusive education

The recognition dimension of social justice deals with the recognition of socio-cultural identities of different groups of learners (Tikly, Barrett, 2011). Inclusivity in this case demands attention to the cultural dimension of schooling which includes the impact of norms and values that can constitute barriers to disadvantaged groups (Tikly, Barrett, 2011; Polat, 2011). This dimension requires of inclusive education that recognizes individualism, normality and the promotion of the world of equality in all respects. This calls for the recognition of individuals and non-discrimination on the bases of race, sex, sexual orientation, religion, nationality and ethnicity (Banister, Reinhart, 2011; Tikly, Barrett, 2011; Polat, 2011).

The use of ICT comes handy with this dimension because different learners regardless of their barriers to learning, impairment and disabilities can be assisted. Teachers can use technological resources to ensure quality teaching and learning for all groups of learners (Polat, 2011). Apart from the normal mainstream technologies, teachers can be assisted by using assertive technologies that compensate for the difficulties that learners might have. Examples of assertive technologies include, among others, screen readers, alternative keyboards, augmentative and alternative communications devises devices used together with specialized applications technology to cater for individualized educational needs that ensures access to education (Tikly, Barrett, 2011; Polat, 2011).

This dimension calls for teachers to have ICT skills to ensure quality monitoring and data manipulation which can assist to reveal learners that are disadvantaged (Tikly, Barrett, 2011). Teachers need effective models that integrate variations for learning and teaching in the aims, methods, materials and assessments of teaching. This can be accomplished through the new approaches to educational design (Dalton, McKenzie, Kahonde, 2012). According to Dalton, McKenzie, & Kahonde, (2012), the Centre for Applied Special Technology (CAST) in 1998 came up with a new model for educational design called the Universal Design for Learning (UDL).

2.1.2 The relevance dimension of social justice

The relevance dimension is the second dimension that arises from the theoretical understanding of social justice. It deals with the extent to which learning aim, objectives and outcomes are meaningful for all learners, valued by their communities and consistent with national development priorities that are relevant towards a changing global context (Tickly, Barrett, 2011). In relation to social justice the relevance dimension is further concerned with capabilities and functions that people within specific communities and nations value. This dimension calls for the school curricular to recognize and reflect the identities and needs of different social groups (Tickly, Barrett, 2011).

"Education for All", requires of the curriculum of countries to include literacy, numeracy and life skills in order to ensure quality education, relevance and inclusivity, (World Education Forum, 2000). As a subscriber to the Education for All movement, the South African government introduced these subjects in its curriculum. From the, Curriculum 2005, National Curriculum Statement (NCS) R-12 to the present Curriculum and Assessment Policy Statement (CAPS) the curriculum of South Africa is designed to ensure that children acquire and apply knowledge and skills in ways that are meaningful to their lives. The curriculum also aims to promote knowledge in local context, while being sensitive to global imperatives. (DBE, 2011; Reed, Gultig, Adendorff, 2015).

Teaching different Languages, Mathematics and Life Skills enables schools to adhere to the relevance dimension of social justice (UNISEF, 2003). These are indispensable to quality education and human rights. By these skills people are able to do basic things like counting, calculating money, buying, selling and contributing to the economy of the country (DBE, 2011, UNISEF, 2003). This is a social justice issue as people are enabled to participate in the economy of the country and mathematics provides a relevant dimension of social justice in this case. By teaching languages makes the content of different subjects to be relevant, easy and understandable. Many countries are adopting a bilingual or even a trilingual approach, favouring indigenous language in the early years of schooling and the other global languages like English in the later years of schooling (Tickly, Barrett, 2011). Life skills on the other hand, is social justice phenomenon because it teaches learners about issues like HIV/AIDS awareness, health education and conflict resolution (Tickly, Barrett, 2011). Most researchers that are subscribing to the human rights approach to social justice emphasises that life skills in education makes people aware of issues like conflict resolution, cultural repression, social inequality, causes of poverty, causes of war, etc. (Tickly, Barrett, 2011, UNISEF, 2003).

The use of ICT is so important in the teaching of the above mentioned skills. In the teaching of languages, there are a number of computer programmes that can be used to teach people all the different languages of the world. The is also a growing number of computer programmes that are used to teach people mathematics skills at different levels of education. Lastly life skills issues are lately easily dissimilated to all members of communities using different ICT platforms. This dissemination can happen in school, in churches, libraries and at various community environments and ICT becomes handy in the dissemination of these messages.

2.1.3 The democratic dimension of social justice

The democratic dimension relates to the participatory social justice. As mentioned above participation according to Fraser (2007) refers to hearing the voices of all people. This dimension calls for the participation of all individuals in their education, the education of their children and the education of the society at large. The quality of education is a subject of debate for learners, parents and communities. (Tickly, Barrett, 2011, Fraser, 2007). This calls for the voices of all people within the education setup and the participation of every individual in education. Concepts like life skills should not be seen as school subjects only be should be part of the entire education of people i.e. in and outside of school.

According to this dimension education should not only be realised in school but should also be available in other areas of the society. Community organisations, Non –governmental organisations (NGO), religious organisations, advocacy groups, etc should be instrumental in education and the quality of education. These organisations should assist the education system in debating issues around societal norms and values, religion, cultural values, multiculturalism, traditional values, etc. (Tickly, Barrett, 2011).

2.2 Using ICT for social justice in education

The term Information and Communications Technology (ICT) is used to describe the range of hardware (radio, television, desktop computers, portable computers, laptops, iPads, projection equipment, cellular phones, etc) software applications (generic software, specific software, multimedia resources, 'app', etc.) and connectivity (Intranet, Internet) used to communicate, and to create, disseminate, store, and manage information (Kozma, 2005; Nyambane, Nzuki, 2014). ICT characterizes current society, pervading all aspects of modern life. Recently, there has been a global interest in how ICT can best be harnessed to improve the efficiency and effectiveness of education at all levels and in both formal and non-formal settings. (Glazzard, Denby, Price, 2014)

ICT and the realisation of quality education and social justice should not be viewed as separate entities. In the light of quality education, as discussed above, ICT should be viewed as an enable for both innovation and education. ICT has the potential impact to enable teaching and learning to happen anywhere, anytime, and anyhow (Kozma, 2005; Nyambane, Nzuki, 2014). Another important contribution of ICT to the global call for "Education for All" campaign is that ICT has the potential to widen access to education; educational resources improve the quality of teaching and learning and improve the effective management of educational institutions (UNESCO, 2002). ICT is also seen as a way to promote educational change, improve the skills for learners and prepare them for the global economy and the information society (Kozma, 2005).

Furthermore, from a social justice point of view, ICT can be seen as a way to assist governments to improve on service delivery and also be seen as a mechanism for increasing the productivity and efficacy of both the public and the private sector. ICT is regarded as a tool in reducing poverty, extending health services, expanding educational opportunities and generally improving the quality of life. (Kozma, 2005, UNESCO, 2002).

In the context of this paper, the link between ICT, quality education and social justice appears obvious. The use of ICT and its networks have the potential to expand the education institutions' sphere of operations and influence beyond their traditional geographic

boundaries. This simply means that the use of ICT can ensure the inclusion of learners that are in rural areas or remote areas. Again ICT can be used to serve multiple teaching and learning functions and can also serve a diverse array of learners including the disabled and the marginalised groups (Kozma, 2005, UNESCO, 2002).

3. METHODOLOGY

Research design

In order to establish the e-readiness of teachers in using ICT for quality education and social justice. This study employed a qualitative comprising of interviews and questionnaire. The study firstly used interviews followed by questionnaires.

Sample

Purposive sampling was used to identify participants used in the study. These included three Free State Department of Education officials at the level of ICT Senior Education Specialists, that are based in the Motheo Education District. A total of 142 teachers from 10 secondary schools that have computer laboratories in the Motheo Education District. All the teachers that participated in this study were teachers who received ICT continuing teacher professional development i.e. in-service training, from the Free State Department of Education

Data collection

Standardised open -ended interviews were conducted at the offices of the respective ICT Senior Education Specialists. Each interview lasted approximately and hour and a half. The interviews were audio recorded, transcribed and analysed. The interviews questions were divided into themes and sub-themes.With regards to a questionnaire, a closed structured questionnaire was designed on a 5 likert scale of agreement with the variables ranging from Strongly Agree (1); Agree (2); Neutral (3); Disagree (4) and Agree (5). The researcher visited each of the identified schools and the participants were called to the computed laboratory to fill up the questionnaire. The questionnaires were collected after completion. The researcher transcribed and analysed the responses.

Ethical issues

Permission to conduct this study was sought from the Free State Department of Education and was granted. This was followed with permissions from the principals of the 10 schools where participants were selected from. The participants were informed in writing concerning the objectives of the study, the time needed, the meeting place and also what is expected of them. Before the commencement of each session, the objectives were again explained to the participants and their voluntary participation was assured. All the names of participants used in this study were kept confidential. The researcher personally administered the questionnaire and collected it from the participants. All participants were also assured that their responses will be kept confidential and that the data collected will only be used for purposes of this study. Appointments for interviews were made and these were carried out by the researchers.

3. FINDINGS OF THE STUDY

3.1 THE FINDINGS FROM THE INTERVIEWS

The first question revolved around the **Theme: teachers' understanding of ICT**. The three subthemes to this theme were questions about **accessibility of ICT resources to teachers**, **technical know-how** and **technical support.**

The responses obtained on this theme and sub-themes, indicated that there is an attempt from the education department to encourage teachers to integrate ICT in their classrooms. This encouragement is in the form of providing schools with computer laboratories, rolling out laptops and training teachers on how to use different ICT resources.

However, two participants, indicated that policies in other schools restrict teachers access to these resources, the schools' managements are also not willing to provide teachers with access to most electronic resources.

Another external barrier associated with ICT integration in schools according to the respondents is the technical ability of teachers to solve hardware, software and network problems. They all agreed that many teachers have indicated that technical faults discourage them from using ICT in the classrooms. The respondents indicated also that technical glitches such as waiting for the website to open, inability to use certain operating and applications software, failing to connect to the internet, etc discourages teachers in the use of ICT.

The second set of questions focused on the **Theme: Intrinsic factors that encourages ICT integration.** The subthemes to this theme were questions based on **teachers' computer self-efficacy, lack of ICT competence, *gender, resistance to change and negative attitude.***

The respondents all agreed that Teachers' confidence in using ICT in their classrooms contributes directly towards their computer self-efficacy. A lack of confidence and teachers' computer anxiety are the contributing factors towards lack of computer self-efficacy. The also indicated that computer self-efficacy differs with regard to the ages of the educators. The respondents that younger educators are mostly involved on the use of ICT while the older generation totally rejects the use of ICT. Also, according to one respondent, the reason that makes teachers to lack confidence in using ICT is that most of them consider themselves not well skilled to use ICT resources. Teachers in most cases are worried they might expose themselves to their learners that they do not know how to use ICT equipment. They also indicated that Gender differences have been identified as a barrier, among teachers, towards ICT integration. Predominantly, female educators are found to be lacking in the used of ICT. Lastly, the respondents agree to the fact that change is not easy in any circumstance because it deals with beliefs and attitudes. So resistance to change and a negative attitude by teachers towards ICT has been found to be a barrier in the integration of ICT in the classrooms hence affecting the e-readiness of teachers in infusing ICT.

3.1 THE FINDINGS FROM THE QUESTIONNAIRS

Table1: The importance of ICT in education

	Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
1	ICT equipment are very important and useful in schools	88(62%)	54(38%)	0(0%)	0(0%)	0(0%)	142(100%)
2	The use of ICT enables us to communicate to both my learners and their parents	67(47,2%)	59(41,5%)	13(9,2%)	2(1,4%)	1(0,7%)	142(100%)
3	ICTs are useful in assisting teachers to orgarnise and manage their classrooms	69(48,6%)	57(40,1%)	13(9,2%)	3(2,1%)	0(0%)	142(100%)
4	I use computers to prepare my lessons, do work sheets and assessment sheets	69(48,6%)	57(40,1%)	13(9,2%)	3(2,1%)	0(0%)	142(100%)

The analysis of Table 1on the perceptions of teachers about the importance of ICT in education three important issues emerge: firstly, teachers unilaterally agree, be it strongly or just agreeing, that ICT is important in education. Secondly, the majority of teachers agrees that the application of ICTs in schools assists teachers with classroom management including communications with parents, lesson preparation and teaching and learning. However, there was a constant number of teachers who are not sure or are not totally convinced about the applications of ICT in the classroom. Thirdly, there is a constant number of teachers who agrees about the general importance of ICT but the disagree with the application in the classroom. This can be noticed by the responses provided under disagree or strongly disagree in statements 2, 3, and 4.

Again looking at the responses, one notices that there is more or less a balance in the strongly agree and agree responses on statements 2, 3 and 4. The numbers in statement 1 dropped for the benefit of the neutral response. This indicates the feelings of teachers about the applications of ICTs both in the classrooms and in the communities.

Table2: Teachers' perceptions on the use of ICT in improving their teaching and learning

	Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
1	Computers help me to organize my work better and be productive	33(23,3%)	59(41,5%)	46(32,4%)	3(2,1%)	1(0,7%)	142(100%)
2	I'm in complete control and confident in my class when I use ICT resources	27(19%)	59(41,6%)	46(32,4%)	8(5,6%)	2(1,4%)	142(100%)
3	I feel that the use of ICT resources will enhance my own teaching and make me productive	31(21,8%)	68(47,9)	30(21,1)	10(7,1%)	3(2.1%)	142(100%)
4	Most things that ICT resources can be used for in the class, I can do just as well without them	7(4,9%)	12(8,5%)	5(3,5%)	76(53,5%)	42(29,6%)	142(100%)
5	Using computers will assist increase my learners' confidence in learning	34(23,9%)	62(43,7%)	33(23,2%)	11(7,8%)	2(1,4%)	142(100%)
6	Using ICTs assists in accommodating all learners regard less of their differing abilities	31(21,8%)	61(43%)	36(25,3%)	12(8,5%)	2(1,4%)	142(100%)
7	Learners who use ICTs will achieve more that those who do not and can pass their grades with ease	31(21,8%)	61(43%)	36(25,3%)	12(8,5%)	2(1,4%)	142(100%)

The questions above were strategically divided to seek to find firstly the teachers' views about the use of ICT for their teaching. The second part was then used to look into how teachers perceive ICT for learning. The four issues emerge from the table above. Firstly, the majority of teachers agrees that ICT improves their teaching but also a considerable number of them are neutral about this fact. The gap between a group who are neutral and the other groups who strongly agree or agree is not that huge. The neutral group might swing either way but cannot influence the disagreement on statements 1,2 and 3. Secondly, with regard to statement 4 the majority of teaches disagrees with the statement that they can perform much better without the use of ICT resources. Thirdly, with regard to the use of ICT for learning, the majority of teachers agree that ICT can be beneficial to learners, however there are those who still belief that its impact is not to the benefit of learners. Fourthly, when looking at the entire table one realizes that the majority of teachers do acknowledge that ICT is important to improve teaching and learning, however there is an increased number of them who are neutral about this fact and this calls for concern.

Table3: Types of ICT resources that are mostly used by teachers in their classrooms

	Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
1	I normally use radio, CD player and DVD Player and TV	21(14,9%)	53(37,3%)	56(39,4%)	10(7%)	2(1,4%)	142(100%)
2	To enhance my teaching, I use Overhead projector, Scanner, Cameras, etc.	18(12,7%)	29(20,4%)	46(32,4%)	44(31%)	5(3,5%)	142(100%)
3	When planning and presenting my lessons I use my PC or laptop or iPad or Interactive whiteboard	16(11,3%)	22(15,5%)	39(27,5%)	54(38%)	11(7,7%)	142(100%)
4	When I communicating with my learners and their parents. I using a computer and mobile phone	16(11,3%)	22(15,5%)	39(27,5%)	54(38%)	11(7,7%)	142(100%)
5	I normally use the Internet for lesson preparations and worksheets	16(11,3%)	22(15,5%)	39(27,5%)	54(38%)	11(7,7%)	142(100%)

The analysis to responses to questions in relation to resources that are mostly used by teachers point out to three issues. Firstly, the most teachers do acknowledge that they use educational media in their classrooms. Secondly, as the technology of the media advances teachers become non comital to usage. For an example, 14,9% and 37,3% of the teachers strongly agree and agree respectively that they use radio, DVD and TV. While on the other hand as the media become advanced like computers, iPad and Interactive Whiteboard the numbers reduce to 11,3% and 15,5% respectively. Thirdly, the percentages are constant with statement Most student teachers feel that mentor teachers are able to control and discipline their learners. The above table on the matter indicates that 34 (59,65%) strongly agrees with the statement and 17(29,8%) agrees with it while only 3(5,26) disagrees with the statements 4, 5, 6. This means that teachers that are using computers, iPad and Interactive Whiteboard are also using the Internet and mobile technology.

4. CONCLUSIONS

Findings reveal that event though there is general acknowledgement, from the side of government and teachers, that ICT is an important driver of social justice in education. Teachers still experience a number of challenges in infusing ICT in their classrooms. The barriers are mostly in three fold. Firstly, there are first-order barriers which are external factors. These are among others lack of ICT resources, accessibility of ICT resources and technical support. Secondly, there are intrinsic barriers which includes among others, lack of computer self-efficacy, lack of ICT competence, gender differences, resistance to change and negative attitude. Thirdly, there is a barrier in the teachers' ability of design thinking. ICT

requires creativity and the ability to be original and innovative. Lack of design thinking hampers the process of ICT integration and hence its ability to advance the prescripts of social justice.

5. RECOMMENDATIONS

The following suggestions are formulated to enhance the e-readiness of teachers in infusing ICT in their classes. These suggestions will automatically enable the use of ICT to address most social justice issues in education: These are

- ICT has to be central to both pre-service and in-service training in SA.
- There should be collaboration between higher education institutions and the education departments on the training of ICT in schools.
- ICT professional development should be compulsory and should have more CPD points
- Students that are in the education field should have or reach internationally recognised ICT competency level, eg ICDL
- Training of teachers and prospective should be in line with the TPACK framework
- Professionally registered teachers should be given discount, subsidised by government, when purchasing ICT resources eg. computers, mobile phone, iPads, etc
- All schools should Internet should have free Internet to the schooling community and teachers should have a huge discount on data

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Development of Unstressed Syllables in English by using English Camp in English Phonetics Course for First Year Student, English Major, Phranakhon Rajabhat University

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Abstract

This study aimed to 1) develop the ability in pronouncing unstressed syllables of English of students whose were taught by means of English camp activity and 2) examine students' opinion towards working as a group in order to construct the English camp activity. The participants were 60-first year students who enrolled English Phonetics Course at PNRU in the second semester of academic year 2016. Thirty students were obtained by means of purposive sampling. This experiment lasted one semester. The research instruments consisted of 1) a course outline 2 a pretest and a posttest on pronunciation of unstressed syllables 3) pronunciation observation form and 4) a questionnaire for gaining students' opinions towards the activities used to promote English pronunciation through English camp. The statistics used for analyzing data were means and standard deviation (SD.). T-Test for dependent samples was employed to compare the students' pretest and posttest achievement score of unstressed syllables in English through English Camp activities. At the first week of experiment, the pretest was administered to the students. The students were assigned a group project that promoted the students' ability of English pronunciation. At the eleventh week, they were requested to present this task. Then, these group projects were used at the English Camp. Finally, students did the posttest.

The findings revealed that students' ability was better. Their posttest score was higher than the pretest, at the 0.05 level of significance. As the overall, students were quite satisfied when working as a group.

Keywords: *Unstressed Syllables, English Camp*

1. Introduction

English has been used as a global language for a long time. It has the impact in South East Asia due to the collaboration of ASEAN Community in 2015. According to the ASEAN Charter item 34th that ""The working language of ASEAN shall be English". As a result, English language is the first language for communication in ASEAN, and the second language used along with their national language. English in education circumstance is so important in order to develop their citizen to be able to communicate and raise the awareness for ASEAN. English language subject should be practical. Learning in the class is not enough, so to promote English outside classroom will be more effective.

English camp is a kind of activity that helps support learners to learn English in terms of the integration of four skills: listening, speaking, reading, and writing, including thinking

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skill. This activity aims to enable students to practice language usage via the interaction of teachers and learners. It also creates students' positive attitude. English camp is one mission of department of English, Phranakhon Rajabhat University. It is held at least one time a year, which based on the inquiry from other schools or organization. This is such a good opportunity for students to practice English outside the class, to work as a group. This leads to the creative thinking in order to set the English camp activity. When an English camp activity is held, its objectives were the happiness and the interaction of the leader (a person who leads the activity) and the attendant (a person who joins the activity). The important English skills are listening and speaking skills, especially speaking skill and pronunciation. This is essential for the leaders to pronounce the words correctly.

Based on the researcher's experiences, it can be concluded that students have many problems in terms of pronunciation such as sounds, syllables, and words. The most frequently problematic area was that students cannot pronounce the word with more than one syllable correctly due to the different characteristics of Thai and English languages. The stress in English language is varied. The sound of unstressed syllable is reduced to be neutral vowel, which is also reduced the length of the vowel. For instance, "effort" should be pronounced as EF-FERT, (/ˈɛfərt/:schwa sound), not EF-FORT. In addition, the result from the last English camp Prathom 3 showed that the target vocabulary in this level was more than one syllable. Moreover, the leaders usually pronounced the words incorrectly.

At Phranakhon Rajabhat University, students majoring in English study 1532201 English Phonetics. This subject is about theory and principles of how to make a correct pronunciation both English consonants and vowels, both segmental feature and suprasegmental features. The researcher pays more attention on how to enable students to pronounce the word correctly, so the activity outside classroom can be useful for them. In addition, students can implement knowledge learned in the class and create such a desirable characteristics such as group work, creative thinking, time-management, responsibility, expressing opinion, acknowledgement, and expressing social role.

From the statements above, the researcher aims to use English camp activity, integrated with 1532201 English Phonetics, as a tool to improve students' pronunciation in terms of unstressed syllables with the reduction of vowel sound. Students would have chances to practice English outside classroom, including working with the others and thinking creatively. In addition, this study aims to investigate students' satisfactions in the aspect of improving pronunciation via English camp activity.

2. Objectives of the study

2.1 To develop the ability in pronouncing unstressed syllables of English of students whose were taught by means of English camp activity

2.2 To examine students' opinion towards working as a group in order to construct the English camp activity.

3. Significance of the study

The findings from this study can be beneficial as the following:

3.1 This findings can be a guideline for the lecturers who are responsible for English Phonetics Course for two aspects. First, students' pronunciation ability can be improved via

English camp activity. In addition, it can be used to promote students' ability to pronounce unstressed syllables better.

3.2 It can be used as a guideline for developing learners and encouraging learners' interest among other courses.

3.3 Department of English in any curriculums can bring this findings to their way of development and improvement of teaching and learning English courses related to pronunciation of unstressed syllables via English camp activity.

4. Hypotheses

4.1 Regarding the improvement/development of unstressed syllable, it is assumed that students' pronunciation ability is better.

4.2 According to the students' satisfactions towards group work for the creation of English camp activity towards English pronunciation, it is assumed that students had high satisfaction with this group work.

5. Definitions of Key Terms

5.1 English Camp refers to students' assignment in order to create the activity that helps promote English pronunciation with 5-6 members in a group.

5.2 Unstressed syllable refers to a syllable that has no stress and the sound is reduced as the following: /ɪ /,/ ə /, /ɜ:/ (Dauer. 1993)

5.3 English-major students refers to students in a regular program whose major is English of Phranakhon Rajabhat University

6. Scope of the study

Participants and sampling

6.1 Participants: 60-bachelor's degree students who enrolled in 1532201 English Phonetics in the second semester of 2016 were selected.

6.2 Sampling: This was a mixed-method research. Simple random was employed to choose 30 English-major students at the bachelor's degree level and enrolled in 1532201 English Phonetics at Phranakhon Rajabhat University in the academic year 2016.

Period of study

This study lasted for one semester (17 weeks).

6.3 Content used in this study

The content used in this study was based on Kelly (2006): How to Teach Pronunciation in terms of unstressed syllables which focused on word level with consisted of the sound reduction as /ɪ /,/ ə /, /ɜ:/.

7. Research method

7.1 The research instruments consisted of

1) a course outline of 1532201 English Phonetics
2) a list of vocabulary with more than one syllable of Prathom Sueksa 3
3) Pronunciation Record Form
4) Pretest and posttest of unstressed syllable and
5) a questionnaire toward students' satisfaction towards the English Camp activity.

7.2 Process of experiment and data collection

The process of the experiment and data collection is as follows:

1) At the first week, the researcher explained the course outline and assigned the task to students about creating the activity used at the English camp. They were required to submit this task thorough the semester.

2) A sampling in this study was evaluated by pronouncing the words with more than one syllable before the experiment began.

3) When the experiment started, the researcher taught the students to pronounce the word with more than one syllable.

4) The researcher taught students to pronounce the vocabulary for Prathom 3, then the researcher observed the students' behaviour. After that, students worked as a group and create the activity that promote the correct pronunciation including elaborating how to run the activity and the teaching materials.

5) Students made a presentation in the classroom. The lecturers and the rest of the students in the class acted as the participants and evaluators. The score was 10 marks, which was classified according to these areas of evaluation: humor, interest, and creativity that integrated the pronunciation with the activity.

6) The researcher recorded the students' pronunciation with more than one syllable in the pronunciation record form. This was conducted two times: during the creation of activity and during the management of activity. This helped correct the students' mispronunciation.

7) The researcher summarized the results of each group and asked students some questions about their perception of group work and the development of English pronunciation.

8) These activities were brought to use at the English Camp at Prachapibarn School. The researcher observed and recorded the students' pronunciation while they did the activities.

9) The students were tested about words with more than one syllable.

10) The students were required to complete the questionnaire towards the group work for creating English camp activity.

7.3 Data analysis and statistics used for data analysis

Data analysis

1) The score from the pronouncing unstressed syllables was examined by mean and standard deviation (s.d.).

2) Both means and standard deviation of pretest and posttest score were analysed.

3) The findings from the questionnaire towards learners' satisfactions with the English camp activity was analysed by mean.

Statistics used for data analysis

1) Mean and standard deviation (s.d.) were used to analysed the students' pretest and posttest scores.

2) T-Test for Dependent Samples was used to compare both pretest and posttest scores of unstressed syllables.

8. Findings

The results under this study "Development of Unstressed Syllables in English by using English Camp in English Phonetics Course for First Year Student, English Major, Phranakhon Rajabhat University"can be explained as the following:

8.1 After the collaboration for creating the English camp activity for improving English pronunciation, it appears that these students' pronunciation ability related to unstressed syllables is better, which the posttest score is higher than the pretest with level of significance at .05. Students can create new three activities to help improve English pronunciation. In

addition, from the conversation for investigating students' perception, it shows that the students are satisfied with these activities.

8.2 These students are highly satisfied with group work when creating English camp activity that helps promotes English pronunciation.

9. Discussions

A study "Development of Unstressed Syllables in English by using English Camp in English Phonetics Course for First Year Student, English Major, Phranakhon Rajabhat University" can be discussed as follows:

1. The result shows that students can pronounce the unstressed syllable with more than one word better, which the posttest score is higher than the pretest's as the .05 level of significance. This is correct according to the hypothesis. This may be that groupwork for constructing activity for English camp has an effect on pronunciation. Students are confident when they pronounce the words. In addition, learners' learning achievement is improved. This is in line with Nunan(1989) that English learning resource outside the classroom promotes learners' success. Moreover, constructing learning ability and encouraging learners to use knowledge outside classroom is necessary. Furthermore, it corresponds to Suh et.al.(1999) that English learning activity outside classroom is beneficial for enhancing students' English skill. Based on the analysis of the score, it identifies that students' pretest and posttest is quite different. In other words, students' pronunciation ability is quite similar after completing group work (see appendix F-G for S.D. Analysis).

2. According to the students' opinion towards group work for constructing English camp activity, it appears that, as the overall, students are the most highly satisfied with group work a (4.46). Considering in details, it can be explained as follows:

Students have a positive attitude and believe that group work helps support pronunciation as the highest level of satisfaction (4.63). This signifies that the development of language usage causes students' positive attitudes. This is in line with Krashen (1983: 37-38) that learners' satisfaction affects the feeling and relates to the language learning success. It also corresponds with Kaniwaranon (1998) that English camp activity encourages learners' English for communication as well as a good attitude for learning English. This is in line with Charnwaiwit (2012) that after the English camp activity, learners' creative thinking is higher. In addition, this is in line with Tonthong (2006) and Phothong (2001) that English camp activity causes an inspiration on learners' English learning as .01 level of significance, including all English camp activity has high effectiveness.

Second, group work helps encourage learning skill outside the class as the highest satisfaction (4.53). This shows that decision-making on teaching plan, selection of teaching material activity, and selection of teaching material are necessary for teachers in order to make their teaching more effective, which is in line with various styles of learning methods such as cooperative learning and task-based learning (OBEC, 2005 K: 101-128). In addition, English camp activity responds learners' interest and need very well. Instead of learning in the classroom, teachers lecture and assign them to take a test, students have chances to practice and help each other. Also, students can apply learning English in various contexts. This is in line with Root (1999) that while the learners take part in the English camp activity, learners employ a high level of thinking to seek the opportunity to practice language, the ability of taking part in any activities with language learners, the social strategy to develop the understanding of the native speakers' culture, and the awareness of the others' thought and feeling. These are in relation to English learning motivation. With a short time of participating in English camp activity, the motivation is built on learners to seek the new knowledge on their own ability. English camp activity is cooperative learning that is a combination of theory and

practice. Learners possess the academic and social skills which is beneficial for learning in various aspects. This is in line with Kagan (1995) that cooperative learning causes the learners' comprehensible input, and zone of proximal development (Vygotsky, 1978), and development of grammar accuracy. This enables learners to adjust their own grammatical structure which affect the speaking ability when doing the activity. English camp activity focuses on task-based language learning. According to Nunan (2004) that task-based language learning enables learners to use language for meaningful communication. According to Willis (2000) that task-based language learning emphasizes learners to think when conducting the activity. The task is used as a tool to construct the second language learning and connect the all four skills of English language: listening, speaking, reading, and writing. With this process, learners can truly take parts for communication.

Third, students are highly satisfied with their own constructed activity (4.56). The English camp activity and group work enable students to think creatively by exchanging their point of views among their friends and the key speakers who are native and experience many English camp activity. Students can be able to apply the activity and adjust the activity to suit their own characteristics. After that, these activities are planned and tested with students. During the activity time, students can observe the students' participation and have a clear concept of English camp activity. They also initiate the creative activity and stimulate learners to acquire English language learning properly. Students are free of worry of evaluation. They are fun and have a positive attitude toward English language learning.The imaginary and art skill is used to produce interesting and attractive teaching materials. This is in line with Zhou, Shen, Wang, Neber and Johji (2013) that creative thinking can be developed easily in terms of art. In addition, it is related to learning achievement. Learners who have creative thinking is a person who is full of imaginary, initiation, curiosity, and willingness to try new things. A great factor influenced the creative thinking is the idea, analysis, independence, and motivation.

10. Recommendation

The recommendations are as follows:

1. English pronunciation in terms of words and sentence level should be developed.
2. Other problematic areas such as final sounds should be examined.
3. The integration among other subjects should be conducted.

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Education Entrepreneurship Management to Improve Learning Quality in Tunas Daud School Denpasar - Bali

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Abstract

Indonesia needs to prepare the generation of entrepreneurs seriously in order to achieve rapid economic progress. In order to cope this problem, schools should learn from the world of entrepreneurship to improve the spirit in planning and implementing educational programs. This research is conducted to know the efforts done by schools in applying the values of entrepreneurship to improve the quality of learning, and utilize the potential of the school to be economic activities so as to generate profits that can be used to advance education at Tunas Daud school Denpasar - Bali. This research uses qualitative methods, with the aim of understanding the social situation in depth, using participant observation data collection techniques, in-depth interviews, documentation studies, and the combination of all three or triangulation. The results show that the entrepreneurship education program at Tunas Daud school is realized through various aspects, among others: integrated into all subjects; Integrated into extra-curricular activities; Integrated through self-development; The existence of a change of implementation from theory to practice; Through school culture; And through local content. An interactive-applicative learning model should be applied to encourage students to entrepreneurial spirit of learning. The most prominent thing to be used as policy materials is the aspect of entrepreneurship development of the managers of educational institutions and teacher training. Ownership of entrepreneurial spirit for teachers is very important because teachers have a strategic role in the transformation of entrepreneurship culture to their students, which in turn the entrepreneurship spirit of the teacher will always flow from generation to generation.

Keywords: *Education Management, Entrepreneurship Education, Learning Quality*

Introduction

Education should be able to prepare human resources capable of facing various challenges of life both locally, regionally, nationally and internationally. Education that is able to overcome this, is an education oriented entrepreneurial spirit. Entrepreneurship-oriented education is education that applies principles and methodology to the formation of life skills to its students through a curriculum developed in schools.

The icons that the school is only seeking knowledge, then looking for a job, should be changed to seek knowledge and apply it in the field. Thus, national education should be able to bring the educated generation to create jobs. Now it's time students from primary school are taught to recognize different types of entrepreneurship, as an alternative to face the future beyond the ideals of being an office employee.

The framework of entrepreneurship development among educators is very important, because educators are agents of change that are expected to teach the characteristics, traits and character and entrepreneurial spirit for their students. In addition, the entrepreneurial spirit is also indispensable for an educator, because through this, educators will have a work orientation that is more efficient, creative, innovative, productive, and independent.

The quality of learning as a change in individual behavior caused by experience, needs to get attention, so that learning can be perceived as experience gained in daily

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activities which then concluded and become the concept and value system used for future success.

Based on the background of the research mentioned above, then the problems in this research, among others: (1) What efforts are done by schools in applying entrepreneurial values to improve the quality of learning at Tunas Daud school Denpasar - Bali? And (2) What efforts are made in exploiting the potential of the school to be economic activities that generate profits and can be used to advance education at Tunas Daud school Denpasar - Bali?

This study aims to determine, among others: (1) Efforts made by schools in applying the values of entrepreneurship to improve the quality of learning in schools Tunas Daud Denpasar - Bali, and (2) Efforts made to exploit the potential owned By schools into economic activities that generate profits and can be used to advance education at Tunas Daud school Denpasar - Bali.

The theoretical usefulness of this research is to contribute in the development of educational management, entrepreneurship education, and total quality management in education. While the practical usefulness of this research is (1) Contributing in applying entrepreneurship education in school, (2) Contributing to improve the quality of learning in school, (3) Inspiring teachers to use various teaching methods and techniques, (3) Motivating students In conducting entrepreneurship activities early on, (3) Contributing in developing the potential of the school to be economic activities that generate profits and can be used to advance education in schools.

Literature Review

The term entrepreneurship in entrepreneurial management according to Thompshon and Riccuci, as quoted by Fadel Muhammad shows the meaning of management based on enterprise culture, or which is based on the character of "risk culture" (Muhammad, 2008: 24). In its development, the meaning of entrepreneurship is not only applied to the private sector but also to the public sector and education sector.

According to Sulthon (in Imron, 2003: 233), entrepreneurship management in educational institutions is the substance of management of extension education that has an important role to jointly substantiate core education management to realize the desired educational objectives. Entrepreneurship in educational institutions contains two understandings and applications, namely (1) efforts to apply entrepreneurial values in managing educational institutions; (2) exploit the potential possessed by an educational institution into an economic activity so as to generate profits that can be used to advance the educational institution concerned. Lupriyono and Wacik (in Suhardan, et al., 2008) state that entrepreneurial strategies include the development of vision, innovation impetus, Structuring the entrepreneurial climate, and entrepreneurial spirit motivation.

1. Development of Vision / Mission
   The first step in entrepreneurship is to formulate a vision / mission. Vision or mission is a picture of the ideals or wishes of schools that want to be realized in the future. The vision of the school should be formulated clearly, briefly and contains real support for realizing entrepreneurial change or innovation.
2. Innovation Impetus
   According to Rachmat Pambudy, et al (2017) actually entrepreneurship was born side by side with human existence on earth. God created human beings different from other creatures, that is, given the mind. In the mind is contained a mystery of power that is capable of issuing creativity. Oscarius (2016) says entrepreneurial spirit can be realized through creativity, innovation, and hard work. Made Dharmawati (2016) argues that creativity will bring entrepreneurs to innovate their business. With regard to the entrepreneurial spirit of the school, this innovative drive strategy means developing original and innovative ideas. Therefore, every principal in entrepreneurship is required

to have an innovation agenda. This innovation agenda becomes the primary and specific tool in the strategy of enriching a school. The innovation agendas it appropriately refer to a quality tool or quality criterion that reflects the needs and expectations of school education from all interested parties. Alternatively, there are two key elements that can be considered for innovation agendas, including: internal elements of school institutions and external elements of school institutions. The internal elements of school institutions that can be reviewed, including: (a) lessons learned by students, (b) curriculum development / educational programs, (c) teacher professional competence and development of teaching systems, (d) pre-facilities and development / educational facilities, (e) educational financing, (f) school culture development and (g) management behavior itself. External elements of the school's institutions can be assessed include (a) parent / community concerns and participation, and (b) natural and socio-cultural conditions of society. Agenda of innovation as examples of programs that express the entrepreneurship of both elements of the school.

3. Structuring the entrepreneurial climate
   This strategic step is the process of forming elements and atmosphere that support the implementation of innovation agenda. In this case, the commitment and leadership of the principal and the professionalism of the staff / teachers are needed. The pressure of entrepreneurial climate regulation is on improving efforts for the implementation of innovation projects. This means that this strategy emphasizes the internal process of the organization, among others: the efforts made by the school in establishing its management system. This can not be separated from the demands of change to manage the pattern of management itself. In developing this strategy, the principal is required to have the ability to describe the prevailing educational policies in his area, develop transformational and visionary leadership, the ability to manage change and decision-making ability, and the ability to develop profitable networks.
4. Entrepreneurial spirit motivation.
   The importance of motivation is because motivation is the cause, channel and support the human behavior, so willing to work hard and enthusiastically achieve optimal results (Hasibuan, 2005). Irham Fahmi (2013) asserted that in general there is a strong relationship between motivation and entrepreneurship, because something that encourages a person to become entrepreneurs because driven by high motivation. The motivation to start a business and be ready to take risks is a preliminary picture to the entrepreneur.

Entrepreneurship education aims to form human as a whole (holistic), as a person who has the character, understanding and skills as an entrepreneur. Yuyus & Kartib (2010) argue that the concept of entrepreneurship is a creative and innovative ability that becomes the basis for creating something new and different through creative thinking and innovative action to create opportunities through a process, the establishment or growth of a new business profit-oriented, value creation and the creation of unique and innovative new products or services. Tanan (2008) states that entrepreneurship can be formed through a person who is born of an entrepreneurial, environmental, and training parent. Basically entrepreneurship education can be implemented in an integrated manner with educational activities in schools. The implementation of entrepreneurship education is done by principals, teachers, education personnel (counselors), learners together as an educational community. Entrepreneurship education is applied to the curriculum by identifying the types of activities in schools that can realize entrepreneurship education and realize the learners in everyday life.

According to Akhmad Sudrajat (2011), entrepreneurship education programs in schools can be realized and neutralized through various aspects, among others (1) Entrepreneurship Education integrated into all subjects; (2) Integrated entrepreneurship

education to extra-curricular activities; (3) entrepreneurship education through self-development; (4) The change in the implementation of entrepreneurial learning from theory to practice; (5) Integrating entrepreneurship education into teaching materials / textbooks; (6) Integration of entrepreneurship education through school culture; and (7) Integration of entrepreneurship education through local content.

According to Mastuhu (2004), quality is a dynamic term that continues to move; If moving forward is said the quality is getting better, otherwise if moving backwards it says the quality is declining. Quality can be interpreted as superiority or excellence that exceeds the prevailing general standards. Something is said to be of quality if there is a match between the conditions possessed by the desired object, with the intent of the one who wants it. For example the quality of the learning process matches what students expect; More far beyond what is expected to be more qualified, if it happens otherwise, the less qualified.

Jamal (2011) said that an interactive-applicative learning model should be applied to encourage students to entrepreneurship learning spirit. In the implementation of learning, there is a learning innovation strategy known as Spices, which stands for student-centered, problem-based, integrated caching, community-oriented, early clinical exposure, and self-directed learning. This strategy is most appropriate for the entrepreneurial model of learning.

According to Sudrajat (2010), the entrepreneurial headmaster's ability to innovate in determining the success of the school he leads because the principal is able to address the needs, wishes, and expectations of the community for education services for their children. Bambang and Tri (2015) argue that the attitude of the principal as a leader to the work affects the quality and speed of completion of his work. If he knows the specific goals he wants to achieve, then with the right actions he takes the more likely to bring success. Some things that should be applied by the principal include: (1) creative-innovative thinking; (2) able to read the direction of educational development; (3) may show more than some or all elements of the school system owned; (4) need to cultivate teamwork, leadership attitudes, solidarity and solid relationships with all the citizens of the school; (5) able to build a good personal approach with the surrounding environment and not quickly complacent with what has been achieved; (6) always improves the knowledge possessed and the technology used to improve the quality of science; and (7) can respond to future challenges by reflecting on the past and present to be able to apply the concept of management and information technology. In addition, to streamline the function and role of teachers, it is not enough to only increase the number and qualifications of teachers' education and training institutions, but the most prominent thing to be made into policy is the aspect of entrepreneurial development from the managers of educational and training institutions Teachers, so that the prospective teachers have an adequate entrepreneurial spirit. Ownership of entrepreneurial spirit for prospective teachers is very important because teachers have a strategic role in the process of transforming entrepreneurship culture to their students, which ultimately entrepreneurial spirit of the teacher will always flow from generation to generation.

Design/Procedure

The research method used in this study is a qualitative method, with the aim of understanding in depth the management of entrepreneurship education to improve the quality of learning. Data collection techniques used include: participant observation, in-depth interviews, documentation studies, and a combination of all three or triangulation. The informants in this study were the leaders of Menorah Abadi Foundation, the headmaster of Tunas Daud School, the teachers of Tunas Daud School, the administrative staff of Tunas Daud School, and the students at Tunas Daud School in Denpasar - Bali.

Findings/Analysis

A. Efforts made by schools in applying the values of entrepreneurship to improve the quality of learning at Tunas Daud school Denpasar - Bali, among others:
   1. Tunas Daud School formulates vision, mission, student profile clearly and describes real support for realizing entrepreneurial change or innovation in school. The following is the vision, mission, and profile of Tunas Daud school students.

      Vision:
      Being an excellent school through the formation of future leaders who have integrity, ethics, knowledge, and creativity to build a prosperous society.
      Mission:
      a. Developing professional education personnel.
      b. Apply holistic education.
      c. Integrates innovative learning with Christian values.
      d. Facilitate the development of leadership skills.
      e. Establish cooperation with the community and the world of work.
      Student Profile:
      a. Reliance on God
      b. Religious
      c. Knowledgeable
      d. Open minded
      e. Inovator
      f. Problem solver
      g. Communicator
      h. Team player
      i. Reflective
   2. The above description states the real support of the foundation of Tunas Daud school organizers to make changes or innovations that are entrepreneurial in the school.
   3. Through various trainings, teachers are trained to have an entrepreneurial education paradigm by developing original and innovative ideas in carrying out their classroom teaching and learning process.
   4. Train teachers to have entrepreneur-based teaching skills
   5. At the beginning of the school year, principals and teachers are always putting together different programs from previous years, with the aim of making changes (innovation) in schools.
   6. Improve teacher professional competence and development of teaching system, through teacher portfolio assessment.
   7. Organize exhibitions of students' work in the form of products from entrepreneurship-oriented learning, such as: artistic product, product performance, spoken product, visual product, model / construction products, leadership products, and written products.

B. Efforts made in exploiting the potential possessed by schools into economic activities so as to generate profits that can be used to advance education at Tunas Daud schools - Bali, among others:
   1. Equate the paradigm between foundations, school committees, principals, and teachers that school management should be oriented towards the acquisition of results (performance) quality and customer satisfaction-oriented as the parties served.
   2. Empowering the resources available for school management to take place in the creation of an exciting, dynamic, and fun atmosphere.

3. Conducting more practical, efficient efforts with the use of increasingly sophisticated tools and equipment, such as: organizing e-learning in learning, conveying information, announcing student achievement, and communicating among school members through the school website.
4. Involving parents and communities in organizing entrepreneurship education programs.
5. Develop a school management strategy that contains entrepreneurial content to improve the image of schools that seem advanced and quality, and the parties involved in it obtain sufficient levels of welfare and financial benefits.

The entrepreneurship education program at Tunas Daud School is implemented in several ways, namely by integrating into all subjects; Integrated in extra-curricular activities; Integrated through self-development; Integrated through school culture and through local content. Learning modes used include: student-centered, learning through existing problems, can come from simple everyday events, studying subjects in an integrated manner so that students are able to learn various branches of knowledge as well as its relevance, and learn independently to encourage attitudes Pro-active students.

The learning cycle used in entrepreneurial education is exploring, planning, doing, communicating, and reflecting. The exploring stage describes the following: (a) real problems that arise so students are inspired to create a product / service as one solution to solve the problem; (b) the real needs or potential needs in the future, in relation to the problems that have been described.

In the planning phase, it is described as follows: (1) Proposed new ideas of products /services to be created, by: (a) Identifying the deficiencies and advantages of existing product/service models; (b) Identify new elements of products/services to be made, together with evidence of differences with similar products/services. (2) Creating a product/service design and planning the stages of the work process of the product/service to be made.

At the stage of doing contains an explanation of the work process at each stage that has been set, with an example.

In communicating proposed target users of products /services to be made, as well as designing ways to deliver products /services to target users who need, accompanied by explanation of excellence (new elements) of the product /service.

In the reflecting stage described the things that need to be improved, identify the parties who can provide the input/suggestions, ideas, and resources needed, and design a way to establish relationships with the parties that help and the possibility of mutual cooperation Profitable.

In the application of this entrepreneurial-oriented education, the principal directs teachers to familiarize themselves with creative-innovative thinking; Able to read the direction of educational development; Cultivating teamwork, building a good personal approach to the environment and not being complacent with what has been achieved; Always improves the science possessed and the technology used to improve the quality of science.

Based on the learning cycle used and the products produced by Tunas Daud school students, it appears that the application of values and characteristics of entrepreneurship education in Tunas Daud school has been observed, but in terms of management of entrepreneurship education there are still some shortcomings which, if improved, will achieve more results maximum. These deficiencies include learning about the principles of entrepreneurship, the competencies that must be owned by the entrepreneur, the characteristics of successful entrepreneurship, the characteristics of entrepreneurial failure, and basic management skills. On the other hand relating to the efforts of

exploiting the potential of an educational institution into an economic activity so as to generate profits that can be used to advance educational institutions, it is necessary to understand and practice knowledge on how to manage education professionally to achieve quality with a business approach.

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Recommendation

1. Efforts that need to be added in applying entrepreneurial values to improve the quality of learning at Tunas Daud school in Denpasar - Bali include learning about (a) entrepreneurial principles (such as: do not fear failure, passionate, creative and innovative; acting with full calculation in taking risk, patient, tenacious, and diligent, must be optimistic, ambitious, unyielding / sensitive to market / can read market opportunity, doing business with ethical standards, independent, honest, caring environment); (b) the competencies that the entrepreneur must possess (such as self knowledge, imagination, partical knowledge, search skills, foresight, computation skills); (c) characteristics of entrepreneurial success; (d) characteristics of entrepreneurial failure; and (e) basic management skills (such as technical skill, human relations skills, conceptual skills, decision making skill).
2. Efforts to be added to exploit the potential of the school to be economic activities so as to generate profits that can be used to advance education at Tunas Daud schools - Bali, including understanding and application of knowledge on how to manage education professionally to achieve quality by approach Business, such as educational needs analysis, educational production, marketing education management for competitive success, educational outcomes, and professional development and teacher supervision to ensure quality students.

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English language as a barrier for learning Accounting from a South African Perspective

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Abstract

This study has explored the English language as a barrier for learning Accounting in South African Technology Universities. The participants were 28 Accounting students from a South African Technology Education University (female-60%, ages range from 18 to 35). Data was collected through interviews with the participants. The data was thematically analysed by using open- coding. Findings have suggested that the Accounting students who enrol at the South African Technology Education University nowadays use English as a language of learning but do not have adequate linguistic and study skills to cope with the demands of the instruction. They find it very difficult to analyse and interpret financial statements even Accounting transactions, because of the foreign language and terminology used in Accounting. The use of mother tongue may be a solution to overcome the challenges faced by Accounting students in South African Technology Universities. Accounting students may need to acquire strategies to address their language problem in learning Accounting.

Keywords*: Accounting Barrier, English, Language, Performance.*

Introduction

Student language proficiency seems to be a determining factor for success in introductory Financial Accounting courses (Steenkamp & Baard, 2008:118). Proficiency in English for students, who have languages other than English as their first language, is a factor that needs to be considered when investigating student performance. In South Africa many universities have adopted English as the language of teaching and learning. However, for most students English is not the mother tongue or home language (Joubert, 2010:38; Selesho, 2007: 19; Steyn & Kamper, 2011:128). Using students' second language as a medium of instruction is indeed a barrier to effective teaching and learning, and often results in low achievements in different assessments, especially in Financial Accounting as a subject, due to its terminology. The understanding and knowledge of the terms such as assets or liabilities have an impact on the answering of questions, hence influences their achievement in Accounting (Beck, 2011:31). Most of the students enrolling at the higher education institution (HEI), especially in situations where a second language is used as a medium of instruction, do not have adequate linguistic and study skills to cope with the demands of the institution. Some of these students find it difficult to analyse and interpret Accounting statements because of the foreign language (Sekhukhune, 2008:58-59). To overcome this language barrier, some students depend on other students as individuals and as a group to explain specific concepts to them. However, this strategy does not provide a sufficient solution to the issue of a language barrier.

Therefore English proficiency may influence students' performance in Accounting, but only up to a specific point. Students who are proficient in English, but who lack problem-solving skills

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still find it difficult to perform as expected in Accounting, whereas students who possess problem-solving skills and are also proficient in English, are more likely to succeed (Joubert, 2010:41). Although the literature reveals that language is indeed a factor that contributes to the success of students in the Accounting field, a study of Barnes, Dzansi, Wilkinson, and Viljoen (2009:42) has found that achievement problems cannot be attributed directly to poor proficiency in English, but rather appears to be the result of ineffective reading skills and strategies, a lack of knowledge, or an inability to apply knowledge in order to solve problems.

Literature Review

In Chicago, Unite Sate of America (USA) it takes an average of five and half years for freshmen (i.e. first year students) at Commoner University to complete an undergraduate Accounting programme. Only a quarter of freshmen complete their undergraduate Accounting programme in four years. However, the standard duration for these students to complete their junior and senior years is three and a half years (Chen, Yoon, M. and Krissek. 2005:111). Akman and Simga-Mugan (2010:258) indicate that the pass rate of students who participated in a Financial and Managerial Accounting Programme through cooperative learning at the Bilkent University of Turkey, was lower than expected. This can be attributed to the fact that students may not have been ready for a cooperative learning environment, because they had been used to traditional teacher-based teaching methods or approaches. In a traditional teaching approach the teacher is the only source of knowledge and students are viewed as receivers. The traditional approach has successfully dominated the students' school teaching.

It should be noted that the South African University graduation rate of 15% is the lowest in the world. This is a particular concern, given the shifts in employment distribution as a result of the critical shortage of high-level skills in the labour market. Letseka and Maile (2008:1) note that the aforementioned shortage will have a negative impact on the achievement of the government's economic development goals.
Beck (2011:1) further notes that the School of Accounting at the Nelson Mandela Metropolitan University (NMMU) has experienced low pass rates in the National Higher Certificate and Diploma programmes, with only five per cent of the initial 240 students who graduate within the required time during the 2005 and 2006 academic years respectively.

The situation is not any different for the higher education institution (HEI) concerned in this study. In 2010, only five per cent of the students who registered for the Accounting programme managed to complete their degree studies within the required time, namely two years (Registration office of the selected HEI, 2012).

The semester programme is one of the factors that may prolong the completion of a programme to obtain a qualification (du Plessis, Muller &Prinsloo 2005:684). If a student fails, for example, Financial Accounting II in the second semester, but was able to pass the first semester, it implies that the student has to wait for the second semester in the following year to complete his or her programme, causing unnecessary delay, thus an extension of the required time to complete the course.

This factor is not necessarily the only one responsible for poor pass rates. Hence, this study has sought to explore factors that may influence the pass rate in an Accounting programme for a qualification. Although the literature mainly addresses issues such as dropout and students' failure rates, the researcher's additional concern was to explore possible remedies to

assist students who remain in the system and struggle to complete their National Higher Certificate (NHC) qualification within the stipulated time.

Procedure

The study has utilized a phenomenal qualitative inquiry (Ary, Jacobs, Razavieh& Sorensen (2009) to obtain an in-depth understanding of the English language as a barrier of learning Accounting in South African Technology Universities. Participants were a convenience sample of twenty-eight (28), University students (female-60%, black-85%) in the Free State Province of South Africa.The participants were 28 Accounting students from a South African technology education university (female-60%, ages ranged from 18 to 35).

The participating students completed a *semi-structured individual interview* in which the English language was explored as a barrier of learning Accounting in South African Technology Universities. Approval to conduct the research was granted by the ethical committees of the Central University of Technology in the Free State Province, South Africa. Participants consented to the study in writing. Data was collected by the researcher at Central University of Technology - during normal class hours. The names of respondents were not identified for ethical reasons.

Data was thematically analysed by using open- coding procedures (Hesse-Biber&Leavy, 2010). These involved systematically organizing, categorizing and summarizing data and describing it in meaningful themes. Themes were assigned codes in an attempt to condense the data into categories

Findings

Language barriers

Most of the students enrolling at HEIs nowadays, especially in situations where a second language is used as a medium of instruction, do not have adequate linguistic and study skills to cope with the demands of the institution. Some of these students find it very difficult to analyse and interpret Accounting statements, because of the foreign language and terminology.

Participants D: "I think it's a problem with English as some of us are from a township school and ... we are 40 in a class and when we get to university you find a white lecturer and you find that you are many in class and some of us are shy, we are afraid to talk in front of people or around people, this causes us to fail, that is why we are afraid to speak, we are afraid to speak English and again we are afraid of so many people"

Participants F: "It is difficult for me to express myself in the classroom because…..English is difficult and I do not know how to express myself in English"

Students find it difficult to understand Accounting because English is a barrier and affects their performance. Students' understanding of Accounting can be affected by language, especially when it is taught in English and not their mother tongue, as found by (Joubert, 2010:32). When students are constantly barraged by English words in academic texts or discussions in the Accounting classroom, the sheer number of unfamiliar words can be intimidating and at the same time students may struggle to understand many of the words and concepts (Adams,2008).

New terminologies

Some participants highlighted the different terminologies used in the same subject at school and at university level that may confuse students and is regarded as a problem.

Participants B: "*I think the terminology used in a higher learning institution is different than that used in high schools, you will find that in high school in a text book it says characteristics of something, in a test it will be characteristics of something, but here we are not given characteristics, it will be features or something similar."*

Participants G: "Accounting terminology is very difficult….and I become confused when I come across difficult terminology in Accounting"

The terminology and language used in the Accounting textbooks are not according to the level of the Accounting students. A subject text or a lecturer's explanation of subject concepts in English contains a heavy language load when it is filled with specialized, multi-syllable, unfamiliar words compressed into lengthy and heavily embedded sentences and paragraphs. This may be a challenge to students and does affect their academic accomplishment (David, 2013:221).

English proficiency not sufficient

Some participants have hinted that the English proficiency support they received at the institution was not sufficient. Others, however, have hinted that the support did help them. Participants A: "*think the reason why it was formulated was because they realise that high school learners don't know English so they are teaching us how to speak the language and how to understand it.*

Most of the participants have claimed that they are not good in the English language because it is their second language and they cannot understand Accounting because it is taught in English and not their mother tongue. Students claim that they are not good in English and this affects their academic performance.

Participant E: I think that I am not fluent in English, it is not my mother tongue, I do not understand Accounting because I am not good in English and this is-why I am not doing well in Accounting.

Participant H" I am not good in English, I think the challenge is my background, where I have come from and also the foundation obtained from school"

Colombo (2012:79) asserted that if a student's mother tongue is not English, such students will still be required to demonstrate proficiency in the use of English by meeting the requirements of the academic curriculum and the University policy. It is thus critical that learners must demonstrate language proficiency in order to achieve academic success.

Language constraints

The use of students' second language as a medium of instruction may be a barrier to effective teaching and learning, resulting in low performance during assessment, because students might

not have understood what was taught in class. However, some researchers are of the opinion that English proficiency as such is not a problem, but mentioned reading skills, lack of knowledge and the inability to apply knowledge in order to solve problems, as barriers to effective teaching and learning.

Participants E:" It is difficult for us to learn in the classroom because we do not understand Accounting and we pretend that we understand but in the end it affects our performance when we write tests and examinations"

Participants A: "English is not my mother tongue and it is difficult for me to do well and participate because I have a problem with Accounting"

The of teaching and learning English as second language in South African is a challenge to students and influence students' academic performance in Accounting, whereas students who possess problem-solving skills and are also proficient in English, are more likely to succeed (Joubert, 2010).

Recommendation

The study has recommended that Accounting students may need to acquire strategies to address their language problem in learning Accounting. As a matter of fact, the study also recommends that the use of mother tongue can be a solution to overcome the challenges faced by Accounting students in South African Technology Universities. The students have to change their attitude and study methods, make use of opportunities to consult their lecturers, and take more responsibility for their own learning to improve their academic performance in Accounting and to improve their language skills. Students need mentoring especially first year students to cope with the load of work and pressure at the University level, as well as learning approaches, by means of special workshops or programmes for this purpose. The students also need to make use of existing opportunities such as extra classes and to consult their lecturers to address their language problems and Accounting problems. The study indicates that the inconsistency in terminology used at school and university has created problems, therefore proper communication and partnership between the schools and Universities must be strengthened to improve the language skills of students and consistence in terms of Accounting concepts used in Accounting.

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The Effectiveness of Visual-Media to Increase Skill in Decorating the Mineral water case For the Deaf Students in Class IX Special Junior High School YPPLB Padang Indonesia (Single Subject Research)

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Abstract

This research was motivated by the problems that the researcher were found on deaf students in class IX Special Junior High School YPPLB Padang. The students did not know how to decorate the mineral water case, especially with the steps. The purpose of this research is to prove, either visual-media effective or not effevtive to increase skill in decorating mineral water case for deaf students in class IX at SMPLB YPPLB Padang. The design of this reseach was A-B-A design and data analysis techniques was visual analysis chart. The subject for this research was the deaf students, the assessment in this research was percentages that was to calculate the children ability to decorate the mineral water case. Based on the results of the research, the ability of students in decorating the mineral water case through visual-media increased. Baseline condition (A1) was done in five meetings, the ability of the students was 25%. On the intervention condition (B) was done in nine meetings, the students ability increased to 94,44%. At the baseline condition (A2) the ability of students was 94,44%. From the analysis of the data showed that the result change tended to increase (+), from baseline condition (A1) to intervention and baseline (A2) percentage overlape small data that was 44,44% thus illustrate the effect of the intervention through visual media was increasing the ability to decorate the mineral water case for the deaf students. The hypothesis of this research is accepted. It can be concluded that the visual media can increase the skills in decorating the mineral water case for the deaf students at class IX SYPPLB Padang. Researcher suggests to the teachers and the next researchers to make the results of this reseacrh as a reference in developmenting of learning skills at school.

Keywords: *Deaf Students, Decorating Skill, Drink Bottle*

Introduction

This research is motivated by the problems that researcher found in ninth graders of deaf children in SMPLB (Special Junior High School) YPPLB Padang. Children do not know how to decorate the mineral water cases based on the steps appropriately. Vocational is a vocational skill attached to a particular field of work or skill. Vocational is one of the ways to train and provide skills to students. Children with special needs have intellectual and physical inadequacies that need to be given skills in order to have certain skills that can be

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developed and can meet the needs of their own life, by producing crafts that have high selling value.

Depdiknas (Indonesia's Department of Education) (2010: 130) states that the skills taught for deaf children aims to enable them to appreciate and produce local craft product with construction techniques, handicrafts, game objects, woven craft product, and the toy objects using various materials. Based on the opinion above, the skills that will be taught to children deaf are making woven crafts using various materials, and the skill of decorating the mineral water cases is a kind of weaving using raw acrylic beads materials.

Deaf children have limitedness in hearing ability that leads to the limitedness of mastering the language that prevents them from communicating and receiving messages during the learning process or outside the learning process. Because of the limitedness of deaf children, the skills taught are not focused on skills that require oral or verbal communication skills such as journalists. Skills taught in deaf children should be more focused towards psychometric motion. Based on tests that researcher did on two children who have learned to decorate a tissue box, one of the children has not been able to apply how to decorate the tissue box in the decorating the mineral water packaging skill.

In order to gain more information, deaf children mostly use the sense of sight. Therefore, it needs learning media in teaching and learning process so that the information submitted can be well received by the deaf children. The use of media is aimed to support teaching learning process. The media can provide information and learning stages for children or students. Another use of media is aids made by teacher that used in teaching process that can affect climate, condition, and learning environment. Yet, for deaf children who mostly use the sense of sight, the better media that can used by teacher or parents for teaching deaf children is visual media.

Visual media can be used as one of the learning media for deaf children. Visual media used to decorate the mineral water case in the form of silent images is in the form of slides accompanied by an explanation of steps in decorating the mineral water cases in sequence so it will attract their attention to concentrate on receiving the visual meaning that is displayed. It is expected that the use of visual media can improve the ability of children in decorating the mineral water cases.

Based on the explanation above, the author was interested in conducting research that aims to prove whether the visual media can improve the skill of decorating mineral water cases for the ninth graders of deaf children in SMPLB YPPLB Padang.

Literature Review

A. Definition of Skill

Soemarjadi et al (1991: 2) states that skill has the same meaning with dexterity. Dexterity is the ability to do a job quickly and correctly. According to Alya (2008: 264), In the Indonesian Dictionary for Elementary Education, decorate is adorning with beautiful items. From the statement above, it can be interpreted that decorate is to beautify the appearance of an object by using tools and materials that can be used to embellish the appearance.

B. Definition of Mineral Water Cases

The place or case of mineral water consists of two words namely "place" and "mineral water". According to Alya (2008: 788), in the Dictionary of Indonesian for Elementary Education, *the place* is something used to put, store, and put. Meanwhile, according to Sumaji (2008: 13) aqua water or better known as mineral water in the packaging is actually ordinary water that has been through the process of ozone rays or with ultraviolet light.

C. Definition of Media

Media is message sender from learning source or aids that can used as message distributor to reach learning aims. According to Arsyad (2009:3) woerd of media is from Latin language that is *Medius* that means center, mediator or conveyor. Accordingly, media is mediator or conveyor of message from sender to acceptor of message. The use of media can help to arouse new will and interest of students, arousing motivation, stimulation dan bring psychological influence for students. Then, when teachers or parents choosing media, they should consider needs and ability of children or students. For deaf children, who uses many sight of sense, teachers or parents can consider using visual media to help them teach deaf children or students.

D. Definition of Visual Media

According to Sundayana (2014: 9), visual media is a media that can only be seen and does not contain elements of sound. In line with the opinion above, Arsyad (2009: 91) suggests that visual media can facilitate understanding and strengthen memories. Visual can also cultivate student's interest and can provide relationship between the subject matter contents with the real world. According to Arsyad (2009: 91), visual can be in the form of Image representation such as pictures, photos or paintings that show how an object looks like. A diagram is illustrating the relationships of concept, organization, and structure of material content. A map is showing the spatial relationships between the elements in the material content. Graphs such as tables, graphs, and charts (charts) present a picture / preference of data or relationships between a set of images and numbers.

Procedure

Based on the problems studied that is Effectiveness of Visual Media to Improve Skill of Decorating Mineral Water Cases for Ninth Graders of Deaf Children in SMPLB YPPLB Padang, the researcher chose experimental research design in the form of single subject research (SSR), with A-B-A design. Sunanto (2005: 59) explains that: *"Design A-B-A is a development of the A-B design". "This A-B-A design has shown a causal relationship between the dependent variable and the independent variable".* A1 is the initial ability of deaf children who have not been able to decorate the mineral water cases. B phase of intervention is the ability of children to decorate the mineral water cases through the visual media. A2 is the phase after intervention.

According to Arikunto (2006: 128), subject of research is the subject intended to be investigated by researchers, the subject that is being the center of the researcher's attention or target. In this research, the researcher used single subject, which is ninth graders of deaf children.

The variables in this study consist of the dependent variable (target behavior) and the independent variable (intervention). The dependent variable in this research is the skill of decorating mineral water cases. The independent variable is the visual media based on technology that is using silent image in the form of slides accompanied by explanation of steps of decorating mineral water cases.

The usual method used to process data is visual analysis by moving data into the graph. The data were processed based on the components A1, B, and A2.

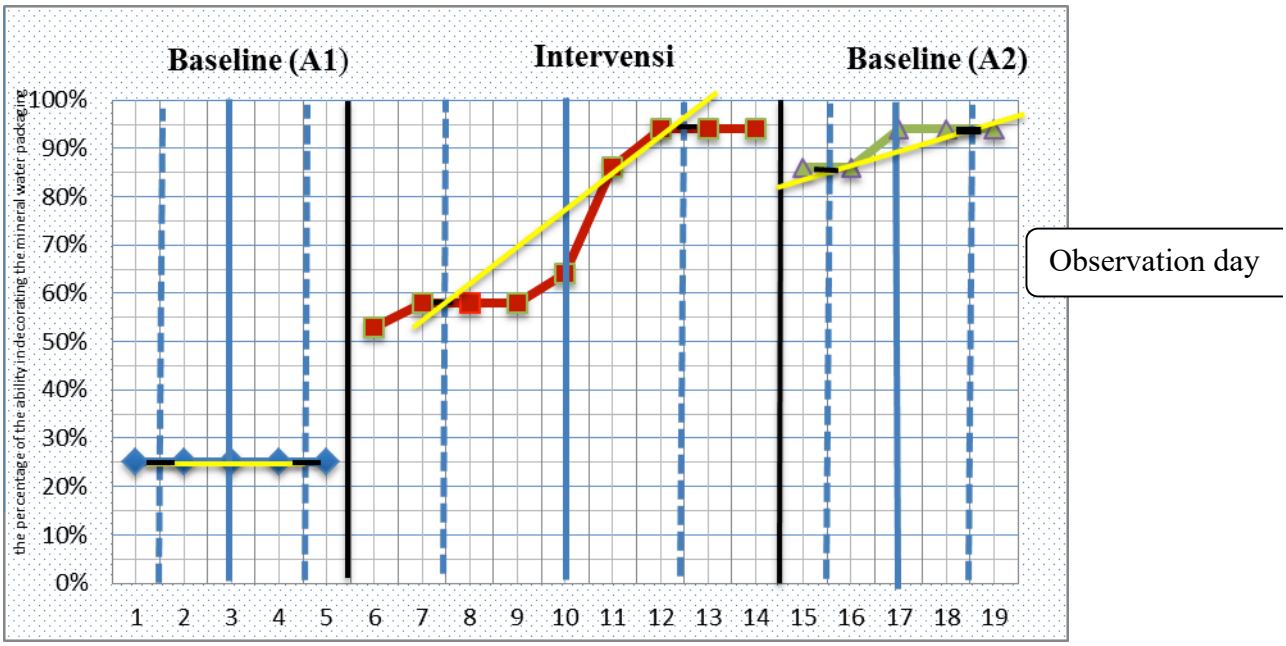
Findings/Analysis

Observation was conducted in three conditions: baseline condition (A1) before treatment, intervention (B) at treatment, and baseline (A2) after treatment. The results of the baseline (A1) study were conducted 5 times; the ability of children to decorate mineral water cases obtained by children was 25% at the first meeting until the fifth meeting.

In the intervention condition (B), observation was conducted 9 times; the percentage of children held at the sixth meeting was 53%, at the seventh meeting was 58.33%, at the eighth meeting was 58.33%, at the ninth meeting was 58.33%, at the tenth meeting was 64%, at the eleventh meeting was 86.11%, at the twelfth meeting was 94.44%, at the thirteenth meeting was 94.44%, and at the fourteenth meeting was 94.44%.

At baseline condition (A2), observation was conducted 5 times; the ability of the child can be maintained without using treatment. The percentage earned by children at the fifteenth meeting was 86.11%, at the sixteenth meeting was 86.11%, at the seventeenth meeting was 94.44%, at the eighteenth meeting was 94.44%, and at the nineteenth meeting was 94.44%.

Based on the analysis of the data that has been done, it can be explained that before the treatment was given in the form of visual media, children's ability was horizontal or there was no changes. When the treatment was given, the ability of children in decorating the mineral water cases improved. After the treatment is discharged, the ability of the child increased.



Picture 1. Condition Graphic *baseline* (A1), *intervensi* (B), *baseline*(A2)

Table 1. the summary of analysis in condition

No	Condition	A1	B	A2
1	The length of condition	**5**	9	5
2	Estimation of direction tendency	**(=)**	(+)	(+)
3	Stability Preference	(Stable)	(Unstable)	(Stable)
4	Data record	**(=)**	(+)	(+)
5	Stability level and	Variable	Variable	Variable

	range	(25% - 25%)	(53% - 94,44%)	(86,11%-94,44%)
6	Changing Level	25% - 25% = 0% (=)	94,44% - 53% = 41,44% (+)	94,44% - 86,11% = 8,33% (+)

The result of visual graph analysis between condition that is the number of variable 1, the change of direction tendency on the condition of conductivity (A) showed no increase, in condition of intervention (B) direction tendency increase, and at condition of baseline (A2) tendency of direction increases. Stability preference ranged from stable, to unstable and to stable. The change in level between B / A1 conditions is 31% while in B / A2 is 41.44%. The percentage of overlap between conditions A1 / B is 0% and in condition A2 / B is 44,44%. The summary of the components of visual analysis between conditions can be seen in the table below:

Table 2. The summary of the analysis between conditions

No	**Kondisi**	**B** / **A1**	**B** / **A2**
1	Number of variables changed	1	1
2	The direction tendency and the effects changes	(+) (=)	(+) (+)
3	The stability preference changes	Stable to Unstable	Unstable to Stable
4	Level Changes	(53% - 25% = 31%)	(94,44% - 53% = 41,44%)
5	*Overlap* Percentage	0%	44,44%

Based on the results of data analysis, the analysis under conditions and inter-condition analysis showed the estimation of direction tendency, stability preference, data record and the rate of change increases positively. Thus, it can be concluded that the visual media is effective to improve the skill of decorating the mineral water cases for the ninth graders of deaf children in SMPLB YPPLB Padang.

In this study, the researcher used visual media to improve the skill of decorating mineral water cases for the ninth graders of deaf children in SMPLB YPPLB Padang. The researcher chose experimental research design in the form of single subject research (SSR) with design A-B-A. This study was conducted outside the school hours for 19 times observation that were divided in three conditions that are, 5 times at baseline before intervention or treatment (A1), 9 times at intervention condition (B), and 5 times at baseline condition after treatment was discharged (A2).

Based on the data analysis that has been done, it can be explained that before the treatment was given in the form of visual media, the children's ability to decorate the mineral water cases was low. Once the treatment has given in the form of visual media, the children's ability increased. After the treatment was discharged, the ability of children in decorating the

mineral water cases spots was also increased. This shows that the visual media is effective to improve the skill of decorating the mineral water cases for the ninth graders of deaf children in SMPLB YPPLB Padang.

The ability of the child increases as proved from the result analysis in the condition by using the direction tendency graph, which can be seen that the tendency of the child's ability increased (+) in the intervention phase (B), and at the baseline phase (A2). The range of data obtained for intervention (B) is 53% to 94.44%, with the level of change in ability to decorate the mineral water cases (+), then the stability of the data tendency is unstable. Meanwhile, the range of data obtained at the baseline (A2) is stable, with the increasing of reading rate ability (+).

Data overlap at first baseline session (A1) and intervention (B) is 0%, while at second baseline (A2) and intervention is 44,44% it shows that the less the percentage of the overlap, the better the influence of intervention to the change of target behavior in this research. From the discussion above, it can be concluded that, visual media can improve the skill of decorating the mineral water cases for the ninth graders of deaf children in SMPLB YPPLB Padang. Deaf children get information through vision, this is in line with the opinion of Sundayana (2014: 9), which stated that visual media is a medium that can only be seen and does not contain elements of sound. In line with the opinion above, Arsyad (2009: 91) suggested that visual media can facilitate understanding and strengthen memories. Visual can also cultivate student interest and can give relationship between the subject matter contents with the real world. Visual media used in this study can train the concentration of deaf children to know the steps to decorate the mineral water.

Recommendation

Based on the result of this study, the researcher addressed some further recommendations:

1. For teachers
   The researcher suggested that visual media can be applied in learning how to decorate the mineral water cases. Visual media can attract the attention of children to put more attention on receiving the visual meaning that is displayed.
2. For further researchers
   The results of this study can be used as a reference and guidance. Despite of the skills, the result of this study can also be implemented for other learning process.

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The Effect of Crossword Puzzle Picture Game toward Learning Outcomes of Social Science Subject for Students with Mental Retardation in Special School

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Abstract

Based on preliminary observations in social learning activities for fourth grade students with mental retardation in Special School Dharma Wanita 01 Pakisaji Malang City it can be found the several problems in learning Social Science, including the students tend to be passive. Students only pay attention to the teacher's explanation when activity based learning, and also students only record material submitted by teachers. Teachers also using less variety of learning media so that making it less attract students. From this fact resulted in the average value of learning Social Science which is only 42.66. The purpose of this study was to determine the effect of crossword puzzle picture game toward learning outcomes of social sciences for fourth grade students with mental retardation in Special School Dharma Wanita 01 Pakisaji Malang City. This research was conducted using the method of experimental research type of research Pre Experimental Design. And in the study, used the design "One group pre-test – post-test design". Results of this study were, before using crossword puzzle game there is one students who received score of 20-39 and there are four students who received score of 40-55. The highest value of the pre-test is 53,3 and the lowest score pre-test was 33.3, while the average is 42.66. The results of the post- after using crossword puzzle game is there is one students who received score 66-79 students and there was four students who received score of 80-100, while the average was 81.34. Judging from the average of the pre-test is 42.66 to average 81.34 post-test results can be said that the student learning outcomes is increased. Based on this result it can be concluded that crossword puzzle game increase the learning outcomes of social sciences for fourth grade students with mental retardation in Special School Dharma Wanita 01 Pakisaji Malang City.

Keywords: *Crossword Puzzle Picture Game, Social Science Learning, Students with Mental Retardation*

Introduction

Understanding of social science is an effort to pursue qualified human being since this learning subject deals with surroundings. In order to give proper understanding about their surroundings and how to interact with them, teachers have to apply various interested learning methods which lead students to find the concept themselves. Through those methods, students are not only sit and listen to teacher's explanation, but also actively formulate their own discernment. It will help them optimize their learning outcomes. Dimyati and Mudjiono (2006:3-4) stated that learning outcome is a result of teaching and learning

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activity. On the teacher's side, teaching activity is ended by learning evaluation process. While for the students, outcome learning is the top of learning process.

Learning process itself is not only for the normal students, but also for them who have special needs. Students with mental retardation, for example. They have think and rational weakness that make their learning and social adaptation capability below the average. It was mentioned by Soemantri (2016:103) that the term of mental retardation was used to describe students whose intellectuality are under average. Mental retardation is classified by Wechsler Intelligence Scale for Children (WISC) as mild mental retardation which has Intelligence Quotient (IQ) score between 69-55, moderate mental retardation which has IQ score between 54-40, and severe mental retardation that has IQ score between 39-25.

From the preliminary observation in Dharma Wanita 01 Special School located in Pakisaji Village, Malang City Province, Indonesia, it was found that light mental retardation students were not interested in social science learning process. They got low concentration and tend to be passive. Some other facts found at the classroom were the material delivered without any educative helping media, there was just one way communication in learning process with the teacher as central point who did not give any chance for students to speak up and participate more in the process. As a result, social science learning had not been attracted for students with mental retardation who have cognitive disorders so that they could not get the optimum learning outcomes for that subject.

Coping this problem, a teacher can create a fun social science learning activity at the classroom through educative games. Ariesta (2009:2) explained that educative games are a tool, used either modern or traditional technology to stimulate students in learning something unconsciously**.** One of those educative games is crossword puzzle picture which is played by answering questions or statement through pieces of letters. Students will fill the box prepared with pieces of letters that arrange a word both horizontally and vertically. Furthermore, the words are dealing with the subjects learned. For example, words of mountain, beach, and river refer to natural environment; whereas road, fishpond, or garden refer to artificially environment which are taught in social science learning.

Based on the interactive characteristic of crossword puzzle, this research tried to determine the effect of crossword puzzle picture towards social science learning outcomes of fourth year mild mental retardation students in Dharma Wanita 01 Special School.

Literature Review

As the member of a society, children with mental retardation are also facing social problems in their surroundings. Therefore, social science learning has an important role in helping them to understand social condition and them how to deal with problems inside. Learning the connection between human and their environment through social science subject at school, children will get better understanding on how should they react and treat their surroundings.

Badan Standard Nasional Pendidikan (BSNP) or Indonesian National Education Standard Council (2006:91) formulated social science as a school subject compiled through Competence Based Curricula which is taught from Sekolah Dasar Luar Biasa (Special Elemetary School) to Sekolah Menengah Atas Luar Biasa (Special Senior High School). In Special Elementary School, social science discuss about human, place and environment, social and culture system, economy and welfare behaviour, time, change, and also continuity.

At the Special Elementary School, some social science material deal with some abstract concepts or messages like time, change, continuity, environment, culture, power, democracy, values and roles. In order to make it simple and easy to understand for the

students, especially those with mental retardation, teachers have to create an attractive and comfortable condition for learning at the classroom. The learning process will be more effective when it is done in an enjoyable situation for the students. One of the proper learning process recommended is using educative games tool to increase students' participation in finding and understanding the concepts, and also achieve an optimum learning outcomes at the end. This research will focus on using crossword puzzle picture game as an alternative in learning social science to students with mental retardation.

Crossword puzzle is a game played by filling empty white boxes with letters to compose a word based on given instruction. The instruction can be given both vertically or horizontally (Nafi 2014:37). Crossword puzzle picture is defined as crossword puzzle with the pictures as instructional guidelines keywords in the form of questions or statements. As stated by Kustiawan (2013:19), picture is a language that describes certain objects which can be understood and enjoyed visually. Pictures which are used as an educative media known as illustration pictures, made manually by hand or technically by computer.

Method / Design

This research was done by using experimental research method. Sugiyono (2015:107) stated that experiment is a research method which applies to observe the effect of certain treatment towards other under controlled condition. Pre Experimental Design with "One Group Pre-test-Post-test Design" were put on to the research. According to Azwar (2005:34), "The subject of the research is the main data research, which contains of researched variable data."

The subject of the research are all the fourth grade mild mental retardation students at Dharma Wanita 01 Special School, amounts five (5) children. Outcomes learning achievement test were trialled to them. Arikunto (2010:193) argued that test are series of questions or exercises, which is a tool used to help in examining skills, intelligence knowledge, and capability or talent as individual or groups.

Pre-test and post-test were used to determine the capability of fourth year mild mental retardation students in understanding competency standard of geographical terms, particularly in understanding terms dealing with natural and artificially environment as a basic competence. The procedure of the research includes planning, implementation, and evaluation phase by using nonparametric statistic. As stated by Djarwanto (2004:1), nonparametric statistic is also known as free distribution method since there is no specific requirements towards the distribution of its population parameter.

Findings and Analysis

1. Learning Outcomes Before Using Crossword Puzzle Picture

Pre-test was done to measure students' basic knowledge towards geographical terms. The students tended to do the test unconfidently. Two of them just looked at the test without doing anything until the time was up. At the end of the time, they answer it without thinking. Here is the recapitulation of the pre-test score:

Table 1
Pre-test Score on Social Science Subject

No.	Name	Score
1	MHM	46,7
2	AEZ	53,3
3	ENS	40,0
4	SA	33,3
5	MS	40,0
Total		213,3
Average		42,66

Based on that table, it is found that there is one student who got score between 20 - 39 and other 4 students got score between 40 – 55. The highest score for the pre-test is 53,3 while the lowest one is 33,3. The average score of the whole class is 42, 66. Distribution of students ability can be seen on the table below :

Table 2
Frequency Distribution of Pre-Test Score

Score Range	Frequency	Percentage (%)	Category
30-39	1	20	Very Low
40-55	4	80	Low
56-65	0	0	Middle
66-79	0	0	High
80-100	0	0	Very High
Total	5	100	

Source: Adapted from Arikunto (2012:281)

It can be seen that 80% of social science ability in fourth grade of mild mental retardation students at Dharma Wanita 01 Special School are in the low category. Other 20% students are having very low ability in social science. The average ability is low, since the pre-test score average is 42, 66.

2. Learning Outcomes After Using Crossword Puzzle Picture

After doing the pre-test, social science learning at the classroom was done by using crossword puzzle picture for four days. The students were learning some geographical terms. Playing the crossword puzzle picture, they were invited to participate more in understanding

some natural environment vocabularies which are beach, river, mountain, sea, and lake; and also five artificial environment vocabularies like pool, road, dam, bridge, and buildings as seen on this crossword puzzle picture:

Figure 1. Crossword Puzzle Picture

Having crossword puzzle picture for four days, the students then did the post-test with the same questions as pre-test with this following result:

Table 3
Post-test Score on Social Science Subject

No	Name	Score
1	MHM	86,70
2	AEZ	86,70
3	ENS	80,00
4	SA	73,30

5	MS	80,00
Total		406,70
Average		81,34

Based on that table, it can be found that there is a student got score between 66-79 and other four students got 80-100 score. The score distribution can be analysed from the table below:

Table 4
Frequency Distribution of Post-test Score

Score Range	Frequency	Percentage (%)	Category
30 – 39	0	0	Very Low
40 – 55	0	0	Low
56 – 65	0	0	Middle
66 – 79	1	20	High
80 – 100	4	80	Very High
Total	5	100	

Source: Adaptation from Arikunto (2012:281)

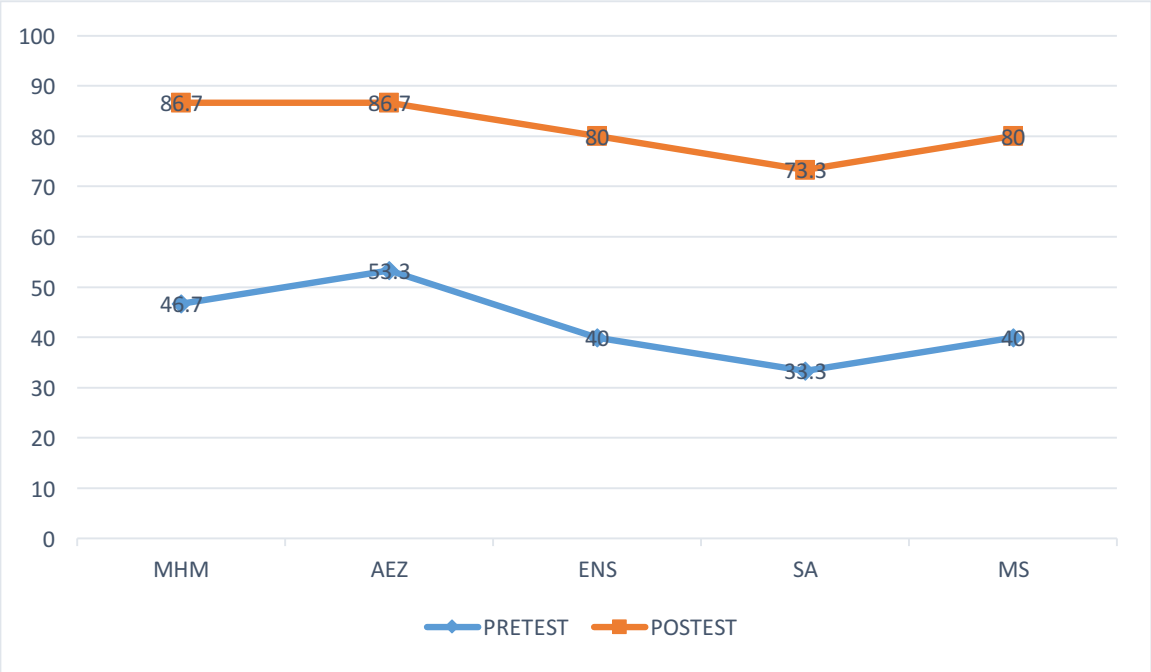
Amount 20% of fourth grade mild mental retardation students in Dharma Wanita 01 Special School have high ability in social science after getting crossword puzzle picture treatment. The rest of 4 students' ability are being at the very high category. The highest score for post-test is 86, 70 while the lowest one is 73, 30. The average score is 81, 34 which is categorized as very high.

Getting the post-test score, the comparison between pre-test and post-test score is illustrated in the next table:

Table 5
Comparison of Pre-test and Post-test Score

No.	Name	Pre-test Score	Post-test Score	Frequency Sign
1	MHM	46,7	86,7	+
2	AEZ	53,3	86,7	+
3	ENS	40,0	80,0	+
4	SA	33,3	73,3	+
5	MS	40,0	80,0	+
Total		213,3	406,7	
Average		42,66	81,34	

Figure 2
Pre-test Score and Post-test Score Social Science Subject



From the graphics above, it can be concluded that pre-test score is lower than post-test score. It shows that there is a difference between social science learning outcomes without using crossword puzzle picture game and social science learning outcomes with using crossword puzzle picture game.

Table 6
Destructive Statistics of Pre-test and Post-test

	N	Mean	Minimum	Maximum
Pre-test	5	42.660	33.3	53.3
Post-test	5	81.140	73.0	86.7

The minimum score before treatment is 33, 3 and increases to 73 after the crossword puzzle picture is given as a treatment with the difference margin amount 39, 7. Pre-test maximum score is 53, 3 and increase to 86, 7 at the post-test score after giving the treatment so that there is a difference margin amount 33, 4. Mean score is also increasing from 42, 6 to 81, 1 after the treatment, with a difference margin amount 38, 5. From those data, it can be

concluded that minimum, maximum, and mean score are increasing after giving the treatment.

This research also applies non parametric statistic using Wilcoxon Marked Ranking Test with these hypothesis:

H_0 : There is no learning outcomes difference before and after giving crossword puzzle picture puzzle in social science learning process toward fourth grade mild mental retardation students.

H_1 : There is a learning outcomes difference before and after giving crossword puzzle picture puzzle in social science learning process toward fourth grade mild mental retardation students.

Testing criteria are:

$T_{count} < T_{table}$ = accepted H_0

$T_{count} > T_{table}$ = rejected H_0

Table 7
Wilcoxon Marked Ranking Test

No	Name	Pre Test (X_1)	Post Test (Y_1)	The Difference (Y_I-X_I)	Ranking
1	MHM	46,7	86,7	40,0	3,5
2	AEZ	53,3	86,7	33,4	1,0
3	ENS	40,0	80,0	40,0	3,5
4	SA	33,3	73,3	40,0	3,5
5	MS	40,0	80,0	40,0	3,5
					T=15

T_{count} which is amount 15 is higher than T_{table} which is 0. When $T_{count} > T_{table}$ (0, 05) or (15>1), so H_0 is rejected and H_1 is accepted. It means that there is a learning outcomes difference before and after giving crossword puzzle picture puzzle in social science learning process toward fourth grade mild mental retardation students. Their social science learning process outcomes is increasing after doing the crossword puzzle picture puzzle.

That educative game supports students with mental retardation in understanding natural and artificial environment vocabularies easier. The learning material becomes more real to them with its pictures which are also more attractive for students. With this interactive game, students are not getting bored. It effects to the learning outcomes tested after the learning process whereas they can get higher score than before using that method.

Recommendation

Based on the research that proves the presence of increasing social science learning outcomes through the using of crossword puzzle picture, this method can be applied to help students, particularly those with mental retardation to understand some abstract terms or definition. Here are some practical steps which are recommended for ensuring the effectiveness of crossword puzzle picture:

1. Make sure that students can enjoy the learning process.
   Teacher should prepare the classroom, the tools, and also the atmosphere to help the students enjoying the process.

2. Make crossword puzzle pictures as attractive as possible.
   Make the puzzle in a proper size to be seen easily. Choose colourful and clearly pictures to describe certain abstract vocabulary.
3. Give enough time to students for observing the picture first, then give them opportunity to describe the picture with their own words and discuss it together. From those upcoming understanding, teacher can elaborate more the academic definition about a picture.
4. Do some repetitions to the vocabularies that is difficult to understand.
5. Facilitate an evaluation with students at the end of learning process so that the teacher can measure their students understanding. On the other hand, students can also express their feeling and refresh the subject learned.

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Using Gamification in Effective Online Safety Awareness Education

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Abstract

Gamification in classrooms has become more widely used as a way to motivate and keep students engaged. Some elements like awarding points and badges have long been used and now more imaginative techniques whereby students go on quests, competing or cooperating with each other individually and in teams. They incorporate physical and intellectual challenges, quizzes and problem solving. In addition components such as leader boards, progress bars, difficulty levels and time restrictions all add to the feeling that you are playing a game. Some of these concepts were used in creating online safety awareness workshops. The first of these concentrated on creating and remembering strong passwords, using a password meter to check how strong their current passwords were and assigning a percentage-based rating. Their respective password strength was recorded on a leader board to create a sense of competition. The participants were then given instructions on how to create strong unique passwords for every site using a pass phrase and a formula. They then had to come up with their own new password, which was rated again to see how much stronger they were compared to their initial one. All proved to be stronger the second time round. The principles from this workshop, namely the introduction of competition, the use of a rating system together with a leader board could be transposed to other settings like, for example, employees in organisations acting as a motivational tool for the use of stronger, more secure passwords, and potentially other desired security behaviours.

Keywords: *Gamification, Online Safety Awareness, Education, Security, Passwords*

Introduction

The teaching of online safety awareness is becoming increasingly important. Von Solms & von Solms (2015) argue that, "cyber safety has become critical in today's world. Young children specifically need to be educated to operate in a safe manner in cyberspace and to protect themselves in the process" (p. 14). This endeavour however, faces a number of challenges to teaching including, "keeping up to date with a rapidly changing landscape; not just in e-safety, but in general terms of trying to understand the technologies" (Atkinson, Furnell & Phippen, 2009, p. 17). Looking at it from another perspective, this provides opportunities for educators and other stakeholders to try out new, innovative ways to approach the issue of online safety.

This paper describes one such approach, namely, Gamification, which is, "the use of game design elements in non-game contexts" (Deterding, Dixon, Khaled, & Nacke, 2011, p. 9). This "approach suggests using game thinking and game design elements to improve learners'

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engagement and motivation" (Dicheva, Dichev, Gennady & Angelova, 2015, p. 1). For our purposes we want to use it to enhance the delivery of online safety awareness lessons.

Elements such as awarding points, stars and badges for achieving objectives have long been used by educators. You can even make a case that the grading of coursework or exams can be regarded as a game element, (Lee & Hammer, 2011, p. 1). However, Lee and Hammer (2011) go on to say that, "educational gamification proposes the use of game-like rule systems, player experiences and cultural roles to shape learners' behaviour" (p. 3). Laster (2010) gives an example where a teacher dropped the use of grades and instead students had to earn experience points. This was to make it "more like a video game, but also lets students feel like they're earning points for getting things right instead of losing them for incorrect answers" (para. 7). An essential part of this is that students get instant feedback and are able to correct themselves if they get something wrong, (Dicheva et al., 2015; Huang & Soman, 2013; Lee & Hammer, 2011).

The second aspect of the study is the actual content of the online safety awareness workshop. For this, the topic of "passwords" was chosen as it is one of the most basic security practices that anyone with an email or social networking account will have had to set up though as Furnell (2014) points out, "passwords are perhaps the most maligned example of security technology" (p. 5). He goes on to say, "fundamentally, it is not impossible to use passwords more effectively... the challenge is not so much the technology, but getting people to use it correctly" (p. 5). The purpose of the workshop is to enable students to do just that, i.e. to create strong passwords that are easy to remember and unique for every resource that they use it for.

Design

Huang and Soman (2013) outline a useful process for designing a gamified lesson or program. This is given below in Figure 1 and using its method we will describe the design of the password workshop.

Figure 1. **Applying Gamification in Education**
(Huang & Soman, 2013)

Understanding the Target Audience and the Context

The target audience in this case were Thai students from 2 schools in Nong Khai in the north east of Thailand. They were all between 16 and 17 years old, 7 were from a local secondary school, 5 girls and 2 boys, and 14 were novices from a Buddhist temple school. In each case the password workshop took the place of their normal computer lesson. The workshop was lead by the researcher with the aid of Thai teachers to help translate from English to Thai.

Defining Learning Objectives

The workshop has one overriding intention and that is to enable the students to create strong passwords that are easy to remember and unique for every resource that requires one.

Structuring the Experience

The 'Password Challenge' workshop is in 5 segments:

1. Introduction: The students are asked to list all the resources where they require a password. They are asked how they create their passwords, if they think they are secure and whether they use the same password in many places.
2. Round 1: All students are asked to enter one of their real passwords on Plymouth University's online 'Rate Your Password' app described in the 'Identifying Resources' section below. Their score which is given as a percentage is recorded next to their name on the board.
3. Password guidance: The students are shown a method on how to create strong passwords. They are then given 10 minutes to use this method to create their own password.
4. Round 2: Using their newly created password they test to see if it is better than their old one using the 'Rate Your Password' app. Their new score is listed on the board next to their old score. The person(s) with the highest percentage score is deemed the winner of the password challenge.
5. Review: A recap on what the password challenge is about, how to construct strong passwords and why it is important.

Identifying Resources

The main resource for this exercise was Plymouth University's online 'Rate Your Password' meter app which can be found at, https://www.cscan.org/passwordstrength, see Figure 2 below. It incorporates a strength meter as well as guidelines on how to create strong passwords. There have been a number of investigations including, Carnavalet and Mannan (2015), Furnell and Bär (2013), Furnell and Esmael (2017) and Ur et al. (2012), all concluding that the presence of guidelines and in particular meters encourages people to create better passwords. Ur et al. (2012) noted comments from participants, "the meter 'motivated [him] to use symbols,' while another 'just started adding numbers and letters to the end of it until the high score was reached.' Participants also said that the meter encouraged or reminded them to use a more secure password" (p. 12). This motivating effect demonstrates why meters are such a useful gaming element.

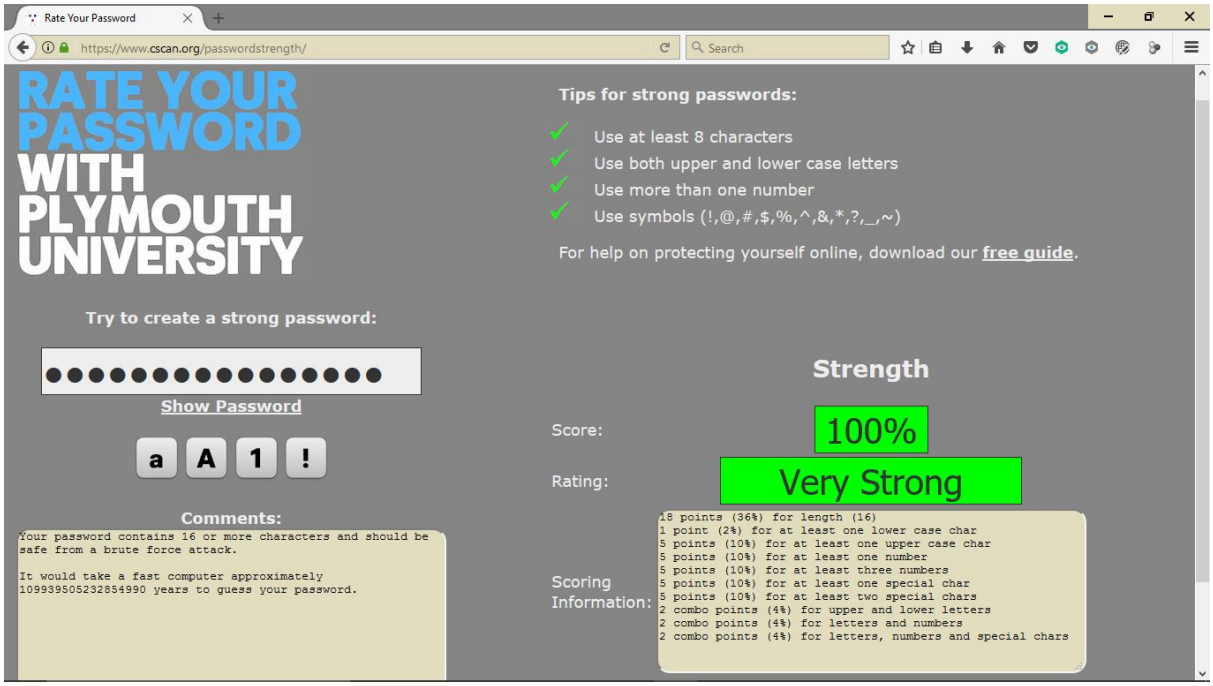

Figure 2. **Plymouth University's Online Password Strength Meter**
(https://www.cscan.org/passwordstrength)

It can be seen from Figure 2 above that the 'Rate Your Password' meter, because it is a learning tool, goes further than most meters by giving the user information on how their score was arrived at. It combines a score measured in percentage and a rating system which goes from, 'Very Weak' to 'Very Strong'. In the comments section it gives a running commentary of what it thinks of your password so far. In our example we achieved 100% but if, for example, our password was, 'elephant' it would give us a score of, 26% and a rating of, very weak. In the comments section it advises to add a combination of characters and not just to use lower case. It also adds that it appear 454th out of the top 10,000 passwords.

To create strong passwords, students were shown how to use a passphrase, a term coined by Sigmund Porter in 1982, (Porter, 1982). Instead of trying to remember a password the idea is to use a phrase instead. Emm (2013) gives the example, 'A stitch in time saves nine'. He suggests using the first letter of each word which gives, 'asitsn'. You then apply a formula to it.

(a) Capitalise the fourth character.
(b) Put the name of the account you're logging into after the second character.
(c) Put the number 3 after the fourth character.
(d) Put a percentage sign after the eighth character.
(e) Move the sixth character to the front.

He gives 2 examples, Amazon, 'aasAm3zo%niTsn' and Mybank,'basMy3an%kiTsn', (Emm, 2013). In this way you can create unique complex passwords but rather than having to remember each password all you have to do is know your passphrase and your formula. A simplified version, shown below, was used for the workshop.

We used the following phrase, 'I love Thailand' and the formula:

(a) First 2 characters of the name of the account you're logging into at the front in capitals.
(b) For all instances of letter 0 change to number 0.
(c) For all instances of letter I change to number 1.
(d) Add the characters :) at the end.

For Facebook this becomes FA1l0vethailand:). For Gmail it will be, GM1l0vethailand:). This formula gives a score of 90% and a rating of, 'Very Strong'.

In terms of material resources, as the meter is an online app a computer with internet connection is required. If possible it should be hooked up to a large screen monitor so can be easily seen by all participants. Lastly, a black or whiteboard where all names and scores can be recorded.

Applying Gamification Elements

By naming the workshop 'Password Challenge' it gives the impression that some kind of game play will be involved. As stated above, the challenge consists of 2 rounds. In the first round they are asked to enter a password that they currently used. As each participant enters their password everyone is able to see what score they achieve. This is then recorded on a whiteboard next to their name. All participants can then see where they rank next to the others.

After they have been given advice on creating strong passwords they are given 10 minutes to create their own passphrase and formula. In round 2 they and everyone else watch as they enter their new password to see if they can beat their first score as well as their fellow participants.

Workshop Results

Both workshops proved to be fun and as Figure 3 below shows, effective in improving the participants password strength.

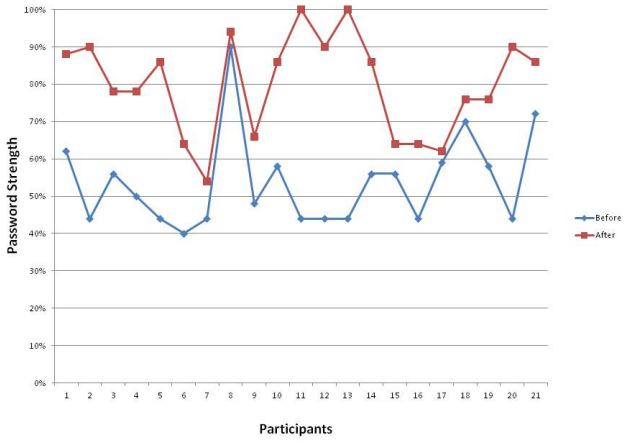

Figure 3. **Password Challenge Workshop Results**

The average percentage point improvement for both workshops, that is, for all 21 participants was 26 with the lowest and highest being 3 and 56 respectively. Two participants went from having weak passwords with a score of 44% to very strong at 100%. It was noticeable that even after the workshops some students and teachers continued to engage with the password meter app in order to try and get the maximum score of 100%. This meant reading the password tips and comments (the game rules) in detail and, in particular, noting that to get the highest score (for this meter at least) you had to have at least 16 characters.

Future Considerations

While the workshop fulfilled its goal of improving participants' passwords, some gamification elements could be enhanced. For example, instead of just writing names on a board, a leader board prop whereby names can be interchanged depending on someone's score could be used. After each participant's go, the leader board gets updated. This will add interest and may incentivise at least some participants to create better passwords.

Dicheva et al. (2014) notes that, "efficient gamification efforts include more than points and badges − they contain challenges and a continual feedback, as well as a high level of interactivity" (p. 90). Therefore the social, cooperative nature of gamification could be included. Instead of working individually they could work in teams to create the passwords. After the second round they can reveal their phrases and formulas and the group as a whole can have an opportunity to discuss and give their feedback.

Conclusion

The password challenge workshop demonstrates how using gamification elements can enhance engagement and motivation of participants in learning a basic yet important security measure, that of creating strong, unique passwords for every resource they use. All participants improved their passwords some quite dramatically, from weak passwords to very strong. Of course the workshop in isolation will not necessarily improve the security practices of the participants. However if it was included as part of a wider online safety awareness programme underpinned by elements of gamification it could help improve engagement and motivation of participants.

It was not only the student participants that were taken with the password meter app, teachers too were trying their best to create passwords that would achieve a very strong rating and a score of 100%. And as other studies, mentioned above, have shown the use of guidelines and strength meters are effective in improving people's passwords. Arnold (2014) argues that, "Gamification is also rapidly becoming an important strategy for all kinds of organizations to drive employee engagement and loyalty ... motivating users to complete mandatory and optional training" (Contemporary Gamification, para. 2). Therefore the use of such workshop techniques need not be limited to young people. It is feasible that they could be used within staff activities in organisations forming part of an employee's induction or training programme enlivening the understanding of password policies beyond the basic guidance document that is normally presented. Furthermore, a strength meter and guideline can be displayed whenever an employee is asked to create or change a password. In this way it will reinforce the learning they have already undertaken.

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Examining Pedagogical Content Knowledge in Mathematics and Science in the Curriculum of Bachelor of Education in Further Education and Training (BEd FET) in South Africa

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Abstract

Pedagogical Content Knowledge (PCK) in mathematics and science education is made critical by the ongoing poor performance of learners in these subjects in South African high schools. This study examines the Pedagogical Content Knowledge in mathematics and science in the curriculum of Bachelor of Education in Further Education and Training (BEd FET) qualification in South Africa. It is foregrounded on interpretive paradigm. Semi-structured interviews, literature review, and document analysis were used to collect data. Purposive sampling was used to select participants for this study. Seven lecturers from five universities and six teachers from six high schools participated. Data was analyzed using the thematic data analysis process. Findings indicated that Pedagogical Content Knowledge has been compromised in the BEd (FET) curriculum as most lecturers and teachers regarded only content knowledge and pedagogical knowledge as the essential knowledge types for teaching mathematics and science. Few participants recognized Pedagogical Content Knowledge as also critical in teaching these subjects effectively

Keywords: *Terms: Content Knowledge; Pedagogical Knowledge; and Pedagogical Content Knowledge*.

Introduction

In South Africa, mathematics and science are considered gateway subjects. However, the country is continuing to experience low learner performance in these subjects. There is seemingly a problem in the conceptualisation and teaching of mathematics and science in the BEd (FET) undergraduate programme. The curriculum of teacher education does not seem to provide courses and programmes for teachers that strengthen their knowledge of these subjects in ways that are useful for teaching. This is in agreement with Makgato and Mji (2006) and Kriek and Grayson (2009) who posit that Higher Education Institutions (HEIs) do not seem to provide adequate knowledge that teachers need to teach mathematics and science.

Literature review

Shulman (1986) addresses the dichotomy of treating content knowledge and pedagogical knowledge separately. Advanced thinking about teacher knowledge is introduced by the idea of pedagogical content knowledge (PCK). This knowledge represents the blending of content and pedagogy into an understanding of how particular aspects of subject matter are organised, adapted and represented for instruction. Pedagogical content knowledge as an interactive knowledge category is used as an example of the rational stance (Gess-Newsome, 1999). Shulman challenges a widespread tacit assumption that the knowledge base for

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teaching involves two knowledges: the knowledge of disciplinary content, and the knowledge of pedagogical methods. He proposes rather that the requisite knowledge base for teaching involves the integration of the two; that is, knowing the substantive disciplinary area, but knowing it in terms of the pedagogical activities that would best enable learners to cope with the likely hurdles and block points.

In Shulman's view, pedagogical content knowledge is a form of practical knowledge that is used by teachers to guide their actions in highly contextualised classroom settings. This form of practical knowledge entails, among other things, knowledge of how to structure and represent academic content for direct teaching to students; knowledge of the common conceptions, misconceptions, and difficulties that students encounter when learning particular content; and knowledge of the specific teaching strategies that can be used to address students' learning needs in particular classroom circumstances. Pedagogical content knowledge builds on other forms of professional knowledge and, therefore, is a critical – and perhaps even the paramount – constitutive element in the knowledge base of teaching. If teachers are to be successful, they have to confront both the issues of content and pedagogy simultaneously by embodying the aspects of the content most germane to its teachability. At the heart of pedagogical content knowledge is the manner in which subject matter is transformed into teaching. This occurs when the teacher interprets the subject matter, finding different ways to represent it and make it accessible to learners (Shulman, 1986). Since PCK is described as an integrated or synthesized knowledge, the development of the knowledges that form the basis for integration must therefore coincide. Cochran, King and DeRuiter (1991) use an analogy to describe the development of PCK not as a salad where the ingredients are merely added together and still retain their individual identities (requiring dressing to blend them together), but rather more similar to chocolate mousse, where the merging of ordinary ingredients results in an entirely new and extraordinary outcome. The development of PCK should form an integral part of the curriculum of Initial Teacher Education (ITE) programs.

Development of PCK

Hurrell (2013) identifies research to support the fact that novice teachers possess a limited repertoire of PCK (Lee, Brown, Luft & Roehrig, 2007; Nason, Chalmers & Yeh, 2012; Wilson, Floden & Ferrini-Mundy, 2002) and that experience is a major influence on the shaping and development of a teacher's PCK (Kleickmann, Richter, Kunter, Elsner, Besser, Krauss & Baumert, 2013; Lee *et al*., 2007). There is further evidence to support that teaching experience alone is not sufficient and that experience, coupled with thoughtful reflection of instructional practices is required (Kleickmann *et al.,* 2013). Although experience is an important factor in the development of PCK, it is not as significant in contributing to PCK as a teacher's opportunity and disposition towards reflection on content knowledge. In this regard, Gess-Newsome and Lederman (1995: 321) state that:

> *…teaching experience alone does not equate with teaching expertise, though the two are often mistakenly confused. Opportunities for a teacher to reflect on classroom practice and implement identified changes, however, greatly influence teaching "expertise". If teaching is to be a purposeful act, and if we want teachers to be able to translate integrated understandings of content into classroom practice, the time and opportunity to develop, codify, and implement such beliefs into the classroom must be fostered.*

Teaching expertise is exhibited when one possesses organised knowledge bases that can be quickly drawn upon while being engaged in the act of teaching (Silverman & Thompson, 2008: 501).

Mathematics teachers' PCK

It is widely accepted that teachers of mathematics need a deep understanding of mathematics (Ball, 1993; Grossman, Wilson, & Shulman, 1989; Ma, 1999; Schifter, 1995). However, it is axiomatic that teachers' knowledge of mathematics alone is insufficient to support their attempts to teach for understanding (Silverman & Thompson, 2008: 3). According to Hurrel (2013), it is well documented that many teachers exhibit weakness and lack a deep conceptual understanding of mathematics. Content-specific knowledge domains for mathematics teachers can be named as mathematics subject-matter knowledge, mathematics curriculum knowledge, and mathematical pedagogical content knowledge (Bukova-Guzel, Canturk-Gunhan, Kula, Ozgur & Elci, 2013). Research has refuted the idea that knowing the subject is enough for teaching that subject (Ball & Bass, 2000; Ball, Thames & Phelps, 2008) and that the structure and type of mathematical knowledge that a mathematics teacher needs to possess has been shown to be different from what a mathematician would need to possess (Ball & Bass, 2000;Ball, Thames & Phelps, 2008; Noss & Baki, 1996). These arguments have led the mathematics education community to highlight mathematical pedagogical content knowledge. Mathematical pedagogical content knowledge enables teachers to transform their own subject-matter knowledge into a form that is comprehensible to students; draw on resources; effectively use various representations and analogies; understand students' thinking; and explain mathematical concepts well (Bukova-Guzel *et al*., 2013).
Ball and Bass (2000) further argue that mathematical pedagogical content knowledge includes knowing on which aspects of a concept to focus, in order to make it interesting to a particular grade level and knowing where students may possibly experience difficulties when problem-solving. In addition, it includes being able to modify problems according to the students' levels and being able to facilitate mathematical discussions.

Ball, Thames and Phelps (2008) aver that although the term PCK is very widely used, it lacks clarity of definition, and its potential has not yet been fully realised. Their refinements of the concept of PCK and its attempt to reframe the study of teaching knowledge are predicated on placing the emphasis on the use of "knowledge in and for teaching rather than on teachers themselves" (2008: 394)

Science teachers' PCK

Magnusson, Krajcik, and Borko (1999) opine that teaching science is a demanding task, requiring teachers to understand not only the science content but also how to translate the content and methods of science into analogous instructional practices. They further argue that the defining feature of pedagogical content knowledge is its conceptualisation as the result of a transformation of knowledge from other domains. Magnusson *et al*. (1999) drawing from the works of Grossman (1990) and Tamir (1988) conceptualise pedagogical content knowledge for science teaching as consisting of five components: (a) orientations towards science teaching; (b) knowledge and beliefs about the science curriculum; (c) knowledge and beliefs about students' understanding of specific science topics; (d) knowledge and beliefs about assessment in science; and (e) knowledge and beliefs about instructional strategies for teaching science. They propose a science-specific PCK model as shown in Figure 2.4 below:

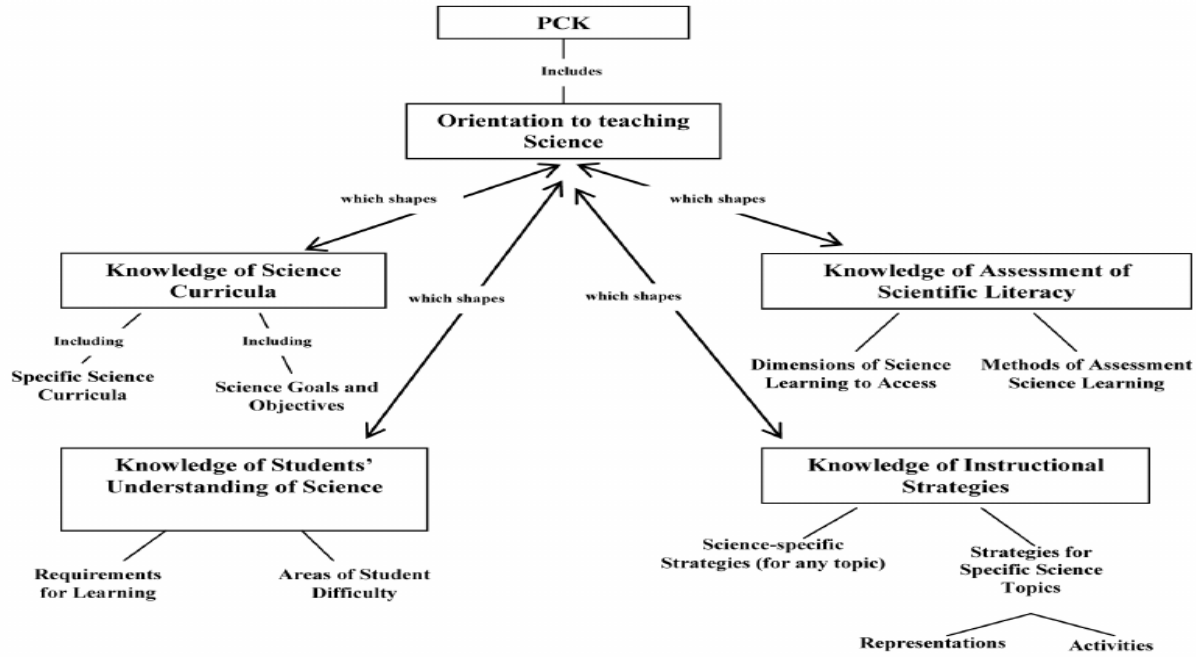

Figure 2.4: PCK model for science teaching. From Magnusson, Borko, and Krakcik, 1999

Magnusson *et al.'s* (1999) model of PCK is useful in providing guidance in that it defines each orientation by providing the goal of teaching science and the characteristics of instruction for that orientation.
Friedrichsen, Van Driel and Abell (2011), after reviewing 24 studies that used the Magnusson *et al*. (1999) model to define PCK, found that the definition of orientations of science teaching was different or simply unclear in many of the studies (Boesdorfer & Lorsbach, 2014). Friedrichsen *et al*. (2011) then proposed that orientations to science teaching should be redefined to include three parts: teachers' beliefs about (1) the goals and purposes of science teaching; (2) the nature of science; and (3) science teaching and learning (Boesdorfer & Lorsbach, 2014). Figure 2.5 below shows the definition of PCK used in Magnusson *et al*. (1999) adapted by Friedrichsen *et al*. (2011).

Research Design

A qualitative design was selected for this research study. Qualitative research is an umbrella concept covering several forms of inquiry that help us understand the meaning of social phenomena with as little disruption of the natural settings as possible (Merriam, 1998). Purposive sampling was used for the selection of participants for this study (Patton, 2002; Denzin & Lincoln, 2005; Creswell, 2007). Faculties or schools of education, which offer BEd (FET) programmes for the preparation of teachers to teach mathematics and sciences, were sampled. Five faculties or schools of education from five universities nationally were selected to participate in the research study. Of these five, one faculty or school of education was chosen from formerly English-speaking universities; one from formerly Afrikaans-speaking

universities; and three from former technikons, now transformed into universities of technology.

Two categories of participants were developed. The first category comprised seven lecturers: Out of each university, faculty or school of teacher education the intention was initially to interview two lecturers, one offering instruction in mathematics and the other in science. In most cases, one lecturer was accessed and interviewed, even though in other cases two were available. These lecturers provided views about individual experiences in the preparation of mathematics and science teachers.

The second category comprised six experienced mathematics and/or science teachers in schools, who graduated with a BEd (FET) degree. The main criterion for inclusion was that these teachers would have gone through the process of teacher training to teach mathematics and science and as a result, are assumed to be in a better position to give informed comments on how they have been taught and how they have acquired the requisite knowledge to be mathematics and science teachers.

Instruments used to collect data for this study were interviews and a literature review. In accordance with the chosen paradigm, semi-structured interviews with individual informants were conducted (Denzin & Lincoln, 1994; Miles & Huberman, 1994; Patton, 2002). Interview schedules were used. The interviews were recorded and later transcribed. The processes, such as data reduction, data display and conclusion drawing/verification was used to analyse data. Policy documents on teacher education, such as the Norms and Standards for Educators (NDoE, 2000) and the Minimum Requirements for Teacher Education Qualifications (NDHET, 2011) were analysed for this study. Reviewing the literature assisted in establishing the background and context of teacher knowledge in mathematics and science in South Africa

Results

Regarding the extent to which theoretical knowledge in the curriculum of BEd that is provided in the faculty/department/school of teacher education to adequately prepare students to teach mathematics and science, teachers were first asked from what they benefited in their university training, in order to survive in the classroom. There was variation in the responses of teachers regarding from what they benefited in their institutions of training. Some teachers indicated that university training enabled them to cope in classrooms and attend to learner questions confidently, as T4 articulated:

> *T4: Yah, it really plays a part because when teaching something you really need a knowledge that is above, 'cos once I know matric stuff I will not be able to [tackle] certain questions. So my university education really did play a part, otherwise I would have left the profession way back. I wouldn't have survived. So university education really plays a part. For somebody to teach matric you need a degree; you can't do it without a degree. You need a degree to teach matric. Those boys and girls they can now think. They are questioning.* (See appendix E11)

T2, however, indicated that while studying at university they did not focus as much on the content as on how to handle the class in terms of discipline and also how to present the content:

> *...so these are the things that I have benefited mostly at university on how to handle, uhm, the class in terms of discipline and how to handle the class in terms of content.* (See appendix E9)

Others indicated that at university they learnt to push themselves and not wait for the lecturer to introduce topics and they were trying to instil the same in their learners. This was articulated by T1 as follows:

> *...whilst at university, I learnt to push myself a lot ... and so I am trying to install that into my learners that they should do the same.* (See *appendix E8)*

Secondly, teachers were asked what level of training (for example, Mathematics I, II, or III) they regarded as adequate for teaching mathematics and science at high school.
There was variation in the teachers' responses regarding the minimum level of specialisation required for a teacher to teach mathematics and science at high school. Some teachers indicated that third-year level was adequate for one to teach these subjects at high school, as alluded to by T2 below:

> *T2: I think Maths 3* (See appendix E9)

Others indicated that it was only after fourth-year level that a teacher would be ready to teach mathematics and science in the high school; that is, after obtaining a degree.

> *T4: I think level 4.*
> *T5: For somebody to teach matric you need a degree; you can't do it without a degree.*
> (See appendices E11 and E12)

Regarding the extent to which content shaped the pedagogy of mathematics and science in the programme of teacher education, some lecturers indicated that because of the inadequate content knowledge that students possessed after grade 12, teaching first-year content and how to teach it proved to be a problem. Even though the students have passed grade 12, they still do not have a clear understanding of the topics they did from grade 10 to grade 12 because they were drilled to pass matric, regardless of whether they understood what they were doing. These students are also taught by teachers who themselves were taught to memorise. Some of the concepts that were considered to be problematic to learners are indicated by L3 below:

> *The concept of limits, that's the first one; they struggle to understand it. What they are good at is to calculate a limit of a function, but to understand what we mean by limit, they don't understand that, they struggle. And also the concepts of financial maths, the session of compound interest, it's challenging, whereby now let's say interest is compounded, it's annually, quarterly and sometimes they get confused. And also what I have seen is in coordinate geometry, they call it analytical geometry. Or maybe it's because we start it in the school level and then from there we expand it, so when we expand it more, somehow they struggle and also functions. What I can say is it depends, you would find that some students are good at certain topics. The other student is good in other topics and in another one's struggles and another is opposite, good in that. It's like that thing is normal, I don't know.* (See appendix E3)

It also emerged that what made learning in mathematics and science problematic was the under qualification of teachers who were trained at colleges of education who still used old and outdated methods of teaching these subjects, as one teacher commented:

> *L2: Now we have only teachers who are outdated teachers who have learnt in colleges; they have memorised and now they know the whole syllabus, but do they contextualise it, do they make it meaningful to our children?* (See appendix E2)

Regarding the extent to which the theoretical knowledge of mathematics and science that students acquire at university prepares them to teach mathematics and science, lecturers were firstly asked to first elaborate on how prepared their students were to teach these subjects after completing their BEd qualification. Some lecturers indicated that their students were ready to teach upon the completion of their BEd qualification since they had equipped these student teachers with the different theories and methods of teaching mathematics and science to guide them in their teaching of these subjects in their classrooms. They also provided students with important skills, such as problem solving. They further indicated that their students were also provided with enough content to be able to teach these subjects at high school as they dealt with high school content in the first year of study. This was indicated by one lecturer's responses below:

> *L3: Having different theories that would help him to teach these topics. How, the how part of how to teach, we have different ways of teaching, and if we don't teach them that part, then it means when they go there they just become redundant teachers; that's my view.* (See appendix E3)
> *Even though we can give them knowledge up until grade 12 but we have to give them beyond the grade 12 because they must have knowledge that is beyond grade 12 knowledge. The second thing that I would like them to have is the pedagogical content knowledge of a specific subject content meaning, that they must not learn only the generic part of methodology but they must have knowledge that is more specific on the issue of mathematics; for example, if they have to do deal with problem solving, how to teach a child in mathematics in terms of problem solving, then those are basically things that a student when he has to leave must have them. Content knowledge, a rich and in-depth content knowledge, as well as a specific pedagogical content knowledge.* (See appendix 2)
> *L3: ... at first year we do topics that are at high school.* (See appendix E3)

Discussions

Helping students to learn subject matter involves more than the delivery of facts and information. There seems to be a tension between content knowledge and pedagogical knowledge in teacher education programmes (Davies & Simmt, 2006). One line of thought is that teachers need to have a solid foundation and understanding of subject matter, not only what they have to teach but well beyond its limits (Baker, Bressound, Epp, Ganter, Haver, & Pollasek, 2004; Even, 1993; Leitzel, 1991). On the other hand, there are others who believe that teachers should focus on the materials they will teach in the classroom and focus more on delivering the content (Hill, Ball & Schilling, 2008). Most research, however, places emphasis on streamlining the two approaches (Davies & Simmt, 2006; Grossman, Stodolsky & Knapp, 2004). The variation in the responses of teachers on what they benefitted from their teacher training institutions to survive in the classroom is indicative of the notion discussed above.

McGraner, Van Der Heyden and Holdheide (2011) argue that mathematics and science teachers must know not only the content they teach, but also how students' knowledge of mathematics and science is developed and structured. They must know how to manage

internal and external representations of mathematical and scientific concepts. They must know how to make students' understanding of mathematics and science visible and how to diagnose student misunderstandings and misconceptions, correct them and guide them in reconstructing the complex, conceptual knowledge of mathematics and science, which is an aspect of PCK. They further contend that teachers must understand how students reason and employ strategies for solving mathematical and scientific problems and how students apply or generalise problem-solving methods to various mathematical and scientific contexts. This can happen only if mathematics and science teachers are adequately qualified to teach these subjects.

The low level of output in these subjects at high school has a direct impact on the capacity of the system to produce qualified teachers in mathematics and science. In most cases, those that obtain a good pass in these subjects find it less attractive to choose teaching as a career, thus creating a vicious cycle in the undersupply of teachers of mathematics and science (McGraner *et al.*, 2011).

Conclusion

Findings suggest that the curriculum of the BEd (FET) program is mainly concerned with the development of both subject matter knowledge and pedagogical knowledge as separate entities. The curriculum does not provide adequate opportunities for the development of PCK. It is further concluded that novice teachers have major concerns about PCK and that they struggle with how to transform and represent the concepts and ideas in ways that make sense to the specific learners they are teaching.

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Traditional Embroidery *(Panulam)* and Beads Making *(Panuhog)* of the Higaonon: Reveals History and Culture

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Abstract

The study discusses the traditional embroidery, beads making, and soil paintings of the Higaonon in Barangay Rogongon, Iligan City. The Higaonons are the Lumads (native) of Mindanao residing in Barangay Rogongo Iligan City. They uphold their indigenous custom, beliefs and practices despite the strong influence of modernization and change. The Higaonon cling to their communal views of the land, cooperative work exchanges, communal ritual, dances, songs, folklores, arts and crafts. Through the years, the embroidery and weaving produced by the Higaonon can be considered elements in the construction of their ethnic identity.

The methodology adopted in this study includes ethnological research methods and field visits in the barangay. Observation has also been employed on traditional ways of the Higanonon on their costume and accessories. Consultative meetings with the tribal leaders were conducted to agree on the conditions, schedule and place of the training. The training was conducted for six months, to enhance the skills and produce products for enterpreneurships.

Generally, the feedback of the Higaonon was positive. The respondents were able to produce accessories, soil paintings, and Higaonon costumes. Children enjoyed their soil paintings and the elders their mat weaving. Thus, they requested to continue the program for another participants to focus on the youth. It was likewise recommended that funding agencies, especially the NGOs and LGUs will help finance the needed materials for their trainings for livelihood of this ethnic group of the city for economic sustainability and cultural preservation.

Keywords: *Traditional Embroidery, Beads Making, Painting, History, Culture*

Introduction

Indigenous groups from different parts of the Philippines practice embroidery and weaving traditions making it one of the oldest local industries observed in the country. The concept of indigenous culture on embroidery as a cultural production that characterizes a process of intellectual, spiritual, and aesthetic development; indicates a given way of life of people; and describes the products and practices of intellectual and artistic activity of the people. However, globalization has made an impact on constantly changing identities and the embroidery of indigenous people.

The study discusses the embroidery and beads making of the Higaonon in Barangay Rogongon, Iligan City and how it reflects their culture and tradition. Higaonons are the Lumads of Mindanao residing in the upland of Barangay Rogongon, Iligan City. They are one of the indigenous groups in Mindanao upholding their traditional customs, beliefs and practices despite the strong influence of modernization and change. The Lumad of Mindanao cling to their communal views of the land, cooperative work exchanges, communal ritual, dances, songs and folklores, arts and crafts. Their language, art, crafts, and dances serve as the major

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symbols of culture, thereby distinguishing them from other cultures in the society. They are concerned on the preservation of their clothing, accessories, spiritual and secular objects, embroidery, soil paintings and weaving.

Travel to these upland barangay from Iligan City downtown is from 1 to 2 hours by motorcycle (habalhabal). Currently, some of the areas are not accessible to jeepneys due to the damaged submarine bridge located between the barangays of Panurogangan and Rogongon crossing Mandulog River.

To help this ethnic group, the Department of Physical Education, in cooperation with the Office of the Vice Chancellor for Administration and Finance, Department of Extension and the Tribal Leaders of Higaonon, conducted research and enhanced skills training on Traditional Embroidery (Panulam), Beads Making (Panuhog) and paintings. This study and enhanced trainings impart to the unemployed adults, out-of-school youth, especially the Higaonon women on the skills of making accessories out of beads, bags, wallets, cellphone holders, among others, which can augment their income. This will be useful for their day-to-day activities as well as in earning extra income. The department answered the needs of this group based on the result of the study, to have a livelihood training for the Higaonon to enhance and preserve their culture and tradition.

Photo 1

Traditional embroidery and weaving defines the culture and behavior of the Higaonon of Iligan City

Objectives of the Study:

This study aims to:

1. study the importance of preserving the culture and traditions of the Higaonon through their embroidery, soil paintings and beads making.

2. conduct trainings on traditional embroidery, beads making and soil painting in answer to their request;
3. analyze how cultural diversity can help the development of Higaonon community_ in Bayug-Iligan Ancestral Domain;
4. produce traditional accessories and Higaonon costume as their means of livelihood
5. enhance the traditional skills and knowledge of the Higaonon in terms of embroidery, painting and beads making;

Methodology:

The methodology adopted in the study includes ethnological research methods and field visits in the barangay. Observation has also been employed particularly on the traditional Higanonon wear their costume and accessories.

Consultative meetings with the tribal leaders were conducted to agree on the conditions, schedule and place for the training. The training was conducted for six months, for them to enhance and master the skills and produce products for sale. Trainors were hired from other Higaonon group in Bukidnon to ensure originality of their indigenous crafts. They were taught on the fundamental skills in adding beads to their embroidery using a basic seed stitch and techniques on how to make their own beads bracelets, headdress, necklace and other Higaonon accessories.

Findings of the Study

The Higaonon with their colorful fabrics serve as an image of their culture thriving together in the Higaonon groups in Mindanao. The nature-inclined designed costume of this tribal group reflects their calm disposition and traditions. Other weaves mirror the surroundings like the Higaonon embroidery as seen in their attire consisting of three colors (red, black and white) depicting their being different from other Higaonon groups in Mindanao.

The traditional embroidery and beads making of the Higaonon is tightly related to the economic activity, social structure and traditional ideology of the group. One of the traditional embroideries of the Higaonon is the use of thread and beads for hair clips, headdress, costume details (collar, cut brims, elbow part of sleeves, cuffs) were decorated with colored beads. Indigenous dresses are decorated with beads and embroidered with Higaonon color identifying their tribe.

After conducting the study, the researchers responded to the request of the local residents and their tribal leader to conduct training reviving their traditional embroidery (Panulam), beads making (Panuhog) and soil painting.

The natives were able to produce decorative items making use of recycled and other indigenous materials found in the locality. The trainers helped in the marketing of some of their products, looked for buyers in the city, and even a place to display their products.

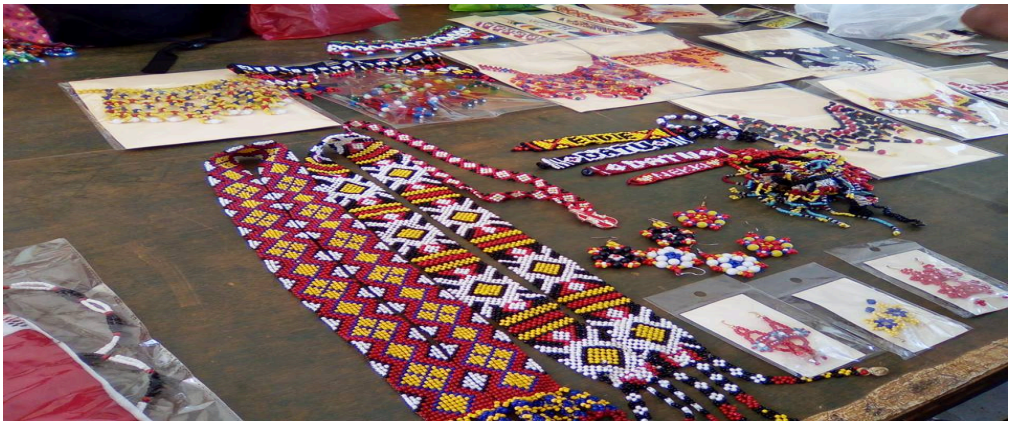
Generally, the feedback of the Higaonon on the training was positive. They even requested to continue the program for other participants and manage on their own as their way of living. They requested to provide more materials for their own use. Hence, the team is looking for other sources to help the needs of the Higaonon.

Photo 2

Baskets produced by the participants after the training

The respondents were able to produce indigenous accessories, baskets, and painting as well as their traditional Higaonon attire. The researchers provided materials to be used by them during the training. Trainers were hired by the team from other Higaonon Tribe in Bukidnon to ensure originality of traditional Higaonon embroidery, weaving, and painting. The participants were taught on how to sew their traditional costumes with hand embroidery. They were also taught on the fundamental skills needed in adding beads to their embroidery using a basic seed stitch. Traditionally, beads embroidery has been used on clothing and decorative textiles and in jewelry with the addition of structural supports such as bracelet bands. They were trained with particular techniques on how to make their own beads bracelet, headdress and other Higaonon accessories. Likewise, the trainees were taught how to make elastic bracelet using overhand and make beaded bracelets.

Photo 3



Higaonon accessories

The evidence mentioned above indicates that the trainings conducted were effective in revitalizing traditional embroidery, beads/basket making and soil painting stimulating economic development. In light of the role that design can play in Higaonon development and social change, it behooves upon us as part of our social responsibility and understand the impact on the Higaonon community. The exploration of knowledge through practice allows respondents to elicit reflection on their working processes and gain new knowledge for their livelihood.

Photo 4

Mat and soil paintings

Conclusion:

From the perspective of promoting the Higaonon culture through embroidery and beads making, developing products based on cultural heritage and local resources can invigorate Higaonon diversity and economic development. Higaonon products reflecting their own identity and highlighting cultural value offer a form of differentiation in an increasingly converging society. For this reason, culturally connected Higaonon crafts are in a particularly strong position to respond to this trend. Imbuing products with authentic characteristics by adapting features from indigenous products could be a strategy to develop products which reflect their differentiation and self-expression.

While weaving defines the cultures and behaviors of the Higaonon, modernization and commercialization has affected their traditional embroidery and crafts. Patterns from woven cloth for their attire are now reflected in fabrics that are manipulated easily by factories. Indigenous-inspired accessories can now be manufactured without the authenticity of their arts. But more importantly, it can results to the decline in the practice of weaving and embroidery by the local weavers. This is the concern of the Higaonon elders, hence, they requested the team to conduct trainings as a documentary on their traditional embroidery and beads making of the Higaonon.

Likewise, it shows that a number of elders in the community practice the traditional embroidery and beads making. Through the years, the elders have aged along with their crafts and traditions. And the more alarming concern is that the younger generations have taken not as much interest in the continuation of their creative industries as their precedents.

Through the years, the embroidery and weaving produced by the lumads can be considered elements in the construction of their ethnic identity in dialogue with the hegemonic use of the same embroidery.

But hope is not lost. Higaonon youths have not completely disregarded the traditional art of embroidery and beads making. There are still some who show interest in preserving their traditional arts by participating in the training programs conducted by the researchers.

Recommendations:

After a review and discussion of the study's main findings, the following are the recommendations that were drawn from the findings of the study:

That collaboration process will be applied to related design practices using indigenous products, and create design approaches to unearth new design possibilities by identifying desirable characteristics in one particular crafts. It is recommended that the academe play a catalytic role in facilitating knowledge creation and transfer, which can cultivate Higaonon indigenous products.

This recommendation of collaborative programs is to empower the youth to further their own innovations, and not confine them to partaking in passive replication. The experiences acquired from this training could be used to inspire the young Higaonons to become aware of their skills, materials, and techniques, and to use these resources to create innovative products.

It is further recommended to collaborate beads making and embroidery design to provide designers with an opportunity to learn how to utilize local materials based on the approaches used in crafting local products, and also provides them with an opportunity to broaden their design perspectives.

Production of Higaonon products should be continued to become more socially effective that will contribute to solving real challenges in the Higaonon community. Researchers/Trainor's have the ability to help indigenous crafts production by applying knowledge to create new innovative business scenarios for livelihood.

As stated above, the emerging embroidery and beads making of the Higaonon recommended that the potential for traditional embroider to be considered careers in the future is promising. However, there is a long way to go and several issues need to be addressed before it becomes possible for this program to become a viable career option.

Furthermore, trainers should emphasize the originality of their embroidery and weaving as prescribed by each Higaonon tribe and should have knowledge on the true meaning of their costume, arts and crafts. They should emphasize the cultural beliefs and practices reflected in each Higaonon attire. Further, the local government should support the programs of the Higaonon in preservation of their culture by providing funding for their livelihood so that they will be united in taking care of their natural resources and not to migrate to other places for greener pasture.

Lastly, we hope that the knowledge and experiences obtained from this study can be applied by young Higaonon as a stimulus for further making of their own local products.

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Our gratitude also goes to their Tribal Leader - Datu Diamla Soong for making necessary arrangements for our visits to their barangay and extending wholehearted cooperation. These discussions have left a lasting impact on us which we have sincerely tried to bring out in this paper with the hope that others would also get similarly sensitized.

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The Perceptions of Physical Sciences Learners on Teacher Implementation of Participative Teaching and Learning in the Classroom

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Abstract

All over the world, science is regarded as a practical subject and practical activities are regarded as the most effective teaching approaches in science. Practical activities contribute significantly to learner understanding of scientific concepts. The Department of Basic Education in South Africa has to constantly deal with the challenges of poor Grade 12 results in general, and physical sciences in particular. To provide a challenging learning environment, it is important for teachers to use resources, material and equipment so that acquired knowledge and skills are applied meaningfully by the learners every day. The Curriculum and Assessment Policy Statement for Grades 10-12 Physical Sciences, advocates for the use of a participative approach to teaching and the promotion of reflective learning. Therefore, to assist learners to achieve the objectives of the curriculum, teachers should encourage learners to participate actively in their own learning. This study examines the implementation of participative learning as a strategy for promoting the application of scientific knowledge in problem-solving by learners. A quantitative approach was adopted because it provided learners with an opportunity to rate the frequency at which teachers implemented participative learning in their classrooms. The researchers used convenience sampling to select the respondents for the questionnaire. A total of 149 learners from local schools completed the questionnaire. Data collected was analysed by using SPSS. The findings are that participative learning is applied frequently (64.1%), occasionally (26.1%) and rarely (9.8%) in the classrooms. Participative learning is applied more frequently in grade
11 (55%) as opposed to grade 10 (45%). Participative learning is applied more frequently in public schools (85.6%) than in independent schools (14.4%). There is no significant relationship between the perceived implementation of participative learning and each of the demographic variables namely, gender, grade level and school category.

Keywords: *Investigative methods of understanding, participative approach, participative teaching, participative learning and physical sciences*

Introduction

After the dawn of democracy, the Department of Basic Education in South Africa is continuously dealing with poor grade 12 results especially in Physical Sciences. Recent policy initiatives in South Africa and the rest of the world have focused on learner-centred or inquiry based instruction to learning (National Research Council, 2011; Department of Education, 2007; Department of Basic Education, 2011). One of the greatest challenges faced by present day teachers is to produce learners who are critical thinkers. In 1995 the South African

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government realised that critical thinking is both an important life skill and educational concept and it was stated as "…. the curriculum, teaching methods and textbooks at all levels and in all programmes of education and training, should encourage independent and critical thought" (Department of Education,1997:10-12). Based on this statement South African Qualification Authority (SAQA) adopted a plan of action to develop critical thinking in 1997 (Pienaar, 2001). For this goal to be achieved, science teaching requires a major shift from traditional methods to more learner centred instructions.

Literature review

Inquiry experiences can provide valuable opportunities for learners to improve their understanding of both science content and scientific practices. However, a number of challenges are faced while implanting inquiry learning in the classroom (Edelson, Gordin and Pea 1999). The goal of implementing inquiry based learning is to help learners to develop critical thinking and integrated learning. The first step in inquiry based learning is generally to develop general inquiry abilities which involve a pursuit of open ended questions and is driven by questions generated by the learners (Blumenfeld, Soloway, Krajcik, Guzdial and Palincsar., 1991, Bell and Linn, 2000). Different methods are used by different disciplines to develop science process skills. Some forms of inquiry that have been explored by researchers include controlled experimentation (Schauble, Glaser, Duschl, Schulze and John 2009). Practical activities or experiments are considered one of the most effective teaching approaches. This simply means that all physical science teachers and other educational stakeholders require an understanding of the need of teaching science through inquiry. Scientific knowledge concept is redefined so as to develop good inquiry skills (Winning, 2010). Learners' perceptions of instructions are important as they direct the learning and how learners perceive instructions, determines the nature and quality of their learning processes. Learners perception of instruction influences learning and study behaviour and eventually learning outcomes (Doyle, 1977; Elen and Lowyck, 1999; Könings, Brand-Gruwel and Van Merriënboer, 2011). Participative teaching and learning is dynamic in nature (Vakalisa, 2011). Participative learning requires linking of old knowledge with new, relates new science content to their lives in and outside of the school and to collaborate with their peers (Blumenfeld *et al.,* 1991; Krajcik and Blumenfeld, 1998). The idea of using learner centred instruction and assessment to develop critical thinking is not new amongst science teachers and researchers. In-depth content knowledge topped with good pedagogical knowledge on how to develop higher order thinking among learners have been identified as critical factors (Shulman1986; Roohan, Taconis and Jochems,2011; Mudau, 2013; Park and Oliver 2008; Rollnick, Bennett, Dharsey and Ndlovu, 2008; Lederman, 2009; Lederman, Lederman, Bartos, Barles, Meyer and Schwartz, 2014; Umalusi, 2015). Theoretically learner centred approach is said to be formative in nature (Andrade, Kristen and Brook, 2012). To improve learning through formative assessment, it is necessary for the learners –in collaboration with their teachers –to become actively involved in their own assessment. This is the reason why learners should act as assessment agents by assessing their own work and the work of others through self-and peer assessment (Heritage, 2007). Participatory methods expect a high degree of activity and personal involvement of participants in the learning process. They are designed only for smaller groups of participants, but their advantage is that they encourage better retention of learning (Kucharčiková and Tokarčiková, 2016).

Research design

In this study a quantitative approach was adopted because it provided learners with an opportunity to rate the frequency at which teachers implemented participative learning in their classrooms. The primary aim of the research was to investigate perceptions of physical science learners on teacher implementation of participative learning in the classroom(s) of secondary schools in the Free State, South Africa. The specific research objectives were to establish:

- Perceived application of investigative methods versus gender.
- Perceived application of investigative methods against grade.
- Perceived application of investigative methods versus school category.

The researchers used convenience sampling to select the respondents for the questionnaire. A total of 149 learners from local schools completed the questionnaire. In order to empirically determine to what extent participative learning is implemented in physical science classrooms, closed ended questionnaires were distributed to 160 learners and 149 responses returned back. Science process skills are activities that scientists do when they study and investigate problems. Consent was given by the parents/ guardians of the respondents to take part in the research. Data was collected during Saturday Science classes that were offered at the Central University of Technology, Free State (Welkom Campus) where the researchers were giving their expertise. Data collected was analysed by using SPSS.

Analysis

Table1. 1: Cross tabulation of perceived application of investigative methods versus gender

		What is your gender?					
		Male		Female		Total	
		Count	Row N %	Count	Row N %	Count	Row N %
Perceived application of investigative methods of understanding content.	Very rarely	1	33.3%	2	66.7%	3	100.0%
	Rarely	6	54.5%	5	45.5%	11	100.0%
	Occasionally	19	51.4%	18	48.6%	37	100.0%
	Frequently	43	51.8%	40	48.2%	83	100.0%
	Very Frequently	3	37.5%	5	62.5%	8	100.0%
	Total	72	50.7%	70	49.3%	142	100.0%

Table1. 2: Cross tabulation of perceived application of investigative methods versus grade

		Indicate your present grade.					
		Grade 10		Grade 11		Total	
		Count	Row N %	Count	Row N %	Count	Row N %
Perceived application of investigative methods of understanding content.	Very rarely	2	66.70%	1	33.30%	3	100.00%
	Rarely	7	63.60%	4	36.40%	11	100.00%
	Occasionally	17	45.90%	20	54.10%	37	100.00%
	Frequently	34	41.00%	49	59.00%	83	100.00%
	Very Frequently	7	87.50%	1	12.50%	8	100.00%

Table1.3: Cross tabulation of perceived application of investigative methods versus school category

		Which one of the following would classify your school best?					
		Public		Independent		Total	
		Count	Row N %	Count	Row N %	Count	Row N %
Perceived application of investigative methods of understanding content.	Very rarely	3	100.00 %	0	0.00%	3	100.00 %
	Rarely	11	100.00 %	0	0.00%	11	100.00 %
	Occasionally	32	86.50%	5	13.50 %	37	100.00 %
	Frequently	71	86.60%	11	13.40 %	82	100.00 %
	Very Frequently	6	75.00%	2	25.00 %	8	100.00 %

Frequency analysis results

Table 2.1: Perceived application of investigative methods of understanding content

	Frequency	Percent	Valid Percent
Rarely	14	9.3	9.9
Occasionally	37	24.7	26.1
Frequently	91	60.7	64.1
Total	142	94.7	100.0
Missing System	8	5.3	
Total	150	100.0	

Table 2.2: Cross tabulation of perceived application of investigative methods of understanding content versus gender)

		What is your gender?					
		Male		Female		Total	
		Count	Row N %	Count	Row N %	Count	Row N %
Perceived application of investigative methods of understanding content	Rarely	7	50.0%	7	50.0%	14	100.0 %
	Occasionally	19	51.4%	18	48.6%	37	100.0 %
	Frequently	46	50.5%	45	49.5%	91	100.0 %

From Table 2.2 the following is observed:

- The application of investigative methods of understanding content is equally rarely done as perceived by male respondents (50%) and female respondents (50%).
- More male respondents (51.4%) perceive that the application of investigative methods of understanding content is occasionally done when compared to female respondents (48.6%).
- More male respondents (50.5%) perceive that the application of investigative methods of understanding content is frequently done when compared to female respondents (49.5%).

Table 2.3: Chi-squared test (perceived application of investigative methods of understanding content versus gender)

		What is your gender?
Perceived application of investigative methods of understanding content	Chi-square	0.010
	df	2
	p-value	0.995

A non-parametric chi-squared test was conducted to test if there was a statistically significant relationship between perceived application of investigative methods of understanding content and gender at 5% level of significance. From Table 2.3 there is no statistically significant relationship between perceived application of investigative methods of understanding content and gender at p-value greater than 0.05, Chi-square (2) =0.010, p-value=0.995. Thus in this sample, gender does not differ significantly in the likelihood of perception on application of investigative methods of understanding content.

Table2. 4: Cross tabulation of perceived application of investigative methods of understanding content versus grade

		Indicate your present grade.					
		Grade 10		Grade 11		Total	
		Count	Row N %	Count	Row N %	Count	Row N %
Perceived application of investigative methods of understanding content	Rarely	9	64.3%	5	35.7%	14	100.0%
	Occasionally	17	45.9%	20	54.1%	37	100.0%
	Frequently	41	45.1%	50	54.9%	91	100.0%

Table 2.5: Chi-squared test (perceived application of investigative methods of understanding content versus grade

		Indicate your present grade.
Perceived application of investigative methods of understanding content	Chi-square	1.831
	df	2
	p-value	0.400

A non-parametric chi-squared test was conducted to test if there was a statistically significant relationship between perceived application of investigative methods of understanding content and grade level at 5% level of significance. From Table 2.5 there is no significant relationship between perceived application of investigative methods of understanding content and gender at p-value greater than 0.05, Chi-square (2) =1.831, p-value=0.400. Thus in this sample grade, level does not differ significantly in the likelihood of perception on application of investigative methods of understanding content.

Table 2.6: Cross tabulation of perceived application of investigative methods of understanding content versus school category)

		Public		Independent		Total	
		Count	Row N %	Count	Row N %	Count	Row N %
Perceived application of investigative methods of understanding content	Rarely	14	100.0%	0	0.0%	14	100.0%
	Occasionally	32	86.5%	5	13.5%	37	100.0%
	Frequently	77	85.6%	13	14.4%	90	100.0%

Table 2.7: Chi-squared test (perceived application of investigative methods of understanding content versus school category)

		Which one of the following would classify your school best?
Perceived application of investigative methods of understanding content	Chi-square	2.295
	df	2
	p-value	0.317

A non-parametric chi-squared test was conducted to test if there was a statistically significant relationship between perceived application of investigative methods of understanding content and school category at 5% level of significance. From Table 2.7 there is no significant relationship between perceived application of investigative methods of understanding content and gender at p-value greater than 0.05, Chi-square (2) =2.295, p-value=0.317. Thus in this sample, school category does not differ significantly in the likelihood of perception on application of investigative methods of understanding content.

Recommendations

For South Africa to produce the number and quality of scientists and technologists the country needs to compete internationally and develop domestically, the number and quality of passes in physical sciences needs to increase. Teacher development lies at the heart of long-term, sustainable improvement. In the South African context, we propose that teachers need development along three dimensions simultaneously: content knowledge, teaching approaches and professional attitudes. The current trend in science education worldwide requires teachers to incorporate inquiry–based instructions into their teaching. This study provides information that participative learning is improving overall in physical sciences in general but several questions are left for future research such as studies were limited for the participants from the Saturday Science classes. In order to improve the quality of participative learning teachers should be incorporated as respondents. Audio video should be recorded when science process skills are implemented in the classroom so that much needed improvements can take place. Furthermore, the instrument used to measure the effects was not fully attuned to the specific redesigned characteristics of each participatory class.

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Taxonomy of Reasons Why Teachers are Reluctant in the Implementation of K to 12 Program

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Abstract

The main purpose of this study is to investigate qualitatively the factors that affect the attitude of teachers with regard to implementation of the K to 12 program. The participants were limited to eighty (80) secondary public school teachers from four (4) big schools in the Division of Iligan City. This study used Grounded Theory Methodology (GTM) and applied Thematic Analysis in analyzing the data. The results showed eight major factors to be considered why Teachers are reluctant in the implementation of K to 12 program: Infrastructure, Facilities and Equipment, Sufficiency and Relevance of IM's (Instructional Materials), ICT Integration Support, Lack of Monitoring and Evaluation of Implementation, Learners' Readiness and Attitude towards Change, Teachers' Readiness and Attitude towards Change, Organizational Support, and Community and Parent Attitude towards Change. It was therefore recommended for government should help the schools in procuring the facilities needed and also be sensitive to the needs of the teachers.

Keywords: *K to 12 Curriculum, Reluctance to Change, Grounded Theory*

Introduction:

The implementation of the K to 12 basic education programs has raised different concerns among the public and educators. The success of this new program is dependent on the participation of teachers and how they cope with the changes. The role of teachers is crucial in the successful implementation of the K to 12 programs. Thus, it is important to assess their attitude and perspective in the current implementation of K to 12 curriculum. This study examines qualitatively the views and experiences of secondary school teachers on the implementation of the curriculum changes.

Teachers shoulder a wide range of roles to support school and student success. They shape the culture of their schools, improve student learning, and influence practice among their peers. Teachers help each other implement new ideas, often by demonstrating a lesson, co-teaching, or observing and giving feedback. However, research has shown that the ways of teaching can be different depending on teachers' different beliefs even when the teachers have similar knowledge and skills (Kim, Kim, et al., 2013). Research on teachers' beliefs has demonstrated that beliefs have an important impact on teachers' practice.

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Research suggests that the success of reforms is dependent on the extent to which they are congenial with teachers' belief about what is worthwhile in education (Annakodi and Indu, 2013). Curriculum change that is incompatible with teachers' knowledge and skills would in all likelihood be met with resistance from them. It would therefore not be unexpected for them to maintain their status quo regarding their traditional teaching practices. As a result, failure to consider the various issues that facilitate and impact learning and change, may lead to lack of implementation of the curriculum reforms. This research therefore examines the perspectives of teachers with regard to the implementation of K to 12 program.

Literature Review:

Öztürk (2013) explained the success of such countries as Finland, Singapore and Canada in education that these countries develop the teaching profession in a way that students continuously have good teachers. However, there is a need to study the processes of educational change as rapid changes can result in complex problems. Such a view of change means that it must be studied as a process rather than evaluated based on the outcomes. More emphasis needs to be placed on examining internal processes of educational change within the institution. Much pressure is placed on the teaching staff to make adjustments to their curriculum and teaching (Sng, 2008).

Sng (2008) stressed that when changes happen too fast, teaching staff may resort to making superficial changes to comply with the demands of curriculum planners and no in-depth change happens to their teaching approaches. In addition, they may not be able to adapt fast enough to changes and may be unaware of the goals as well as desired outcomes. Educational wastage can also result when much time is spent on planning these changes yet teaching approaches and students' learning do not change. This is especially true when there is inadequate preparation for teaching staff to make the needed adjustments.

Demir and Ellet (2014) stated that teacher change processes are internal psychological events that teachers experience in response to an innovation (Demir and Ellet, 2014). Innovations include new practices, policies, knowledge and/or activities comprising new learning and altered professional perspectives and dispositions. For example, technology integration in teachers' technology education promotes professional development among teachers (Kim, DeMeester, et al., 2013). They believed that teachers having interactive knowledge of technology function well and more likely capable of resisting change. Although teachers might believe that technology helps them accomplish professional and/or personal tasks more efficiently, they are reluctant to incorporate the same tools into the classroom for a variety of reasons including the lack of relevant knowledge, low self-efficacy, and existing belief systems (Ertmer, 2010).

Lizer (2013) stated that the way teachers perceive curriculum change might be the reason curriculum change impacts negatively or positively on teaching and learning. She also pointed out that educators' lack of clarity concerning innovation skills and knowledge, as well as the unavailability of required instructional materials reinforces their lack of motivation. This might be the cause of teachers' resistance to change in curriculum innovation.

Sng (2008) found out that a negligence of teachers' beliefs in implementing change will lead to disappointing results. The literature on educational change has therefore highlighted the importance of teaching staff's involvement in the planning and decision-making processes of change. Such literature, however, did not research the specific involvements of teaching staff at

each stage of the change, given the kind of contexts they work in, both organizationally as well as the wider political, social and economic contexts of their countries.

Methods:

This study used Grounded Theory Methodology (GTM) and applied Thematic Analysis in analyzing the data. Eighty (80) secondary public school teachers from four (4) big schools in the Division of Iligan City were taken as respondents. Questionnaire was used as the main data gathering which consisted of four questions. First question was the reasons behind their reluctance that can impede in the execution process. Second question was to obtain information about their negative experiences together with other co-teacher in their respective workplace, since curriculum change has direct impact on the roles and responsibilities of teachers as well as to other constituents in the educational system. Third question was to determine the various government interventions that provides avenue in the success of the K to 12 implementation. The last question was soliciting teachers' suggestions and recommendations that could facilitate an effective implementation process. The results were also validated by three experts to avoid biases and contamination of the researchers' preconceived ideas. The researcher finalized the name of each theme, wrote its description and illustrates it with a few quotations from the original text to help communicate its meaning to the reader.

Results and Discussions:

Certain factors were considered why Teachers are reluctant in the implementation of K to 12 program and there were structured to eight factors namely Infrastructure, Facilities and Equipment, Sufficiency and Relevance of IM's (Instructional Materials), ICT Integration Support, Lack of Monitoring and Evaluation of Implementation, Learners' Readiness and Attitude towards Change, Teachers' Readiness and Attitude towards Change, Organizational Support, and Community and Parent Attitude towards Change.

Infrastructure, Facilities and Equipment

The first cluster of responses pertains to the difficulty of the teachers to adapt to the new K to 12 curriculum due to the perceived lack of preparation in terms of infrastructure, facilities and equipment. A faculty stressed that for teachers, facilities such as laboratory equipment and tools are some of the problems in the implementation of the curriculum reform.

Sufficiency and Relevance of IM's (Instructional Materials)

Teachers have also reluctance on the change of K to 12 on the perception that there is insufficiency and irrelevance of instructional materials (IMs). The unavailability of learning materials is just one of the problems still hounding the country's new basic education program. Because of these problems, teachers are spending their own money in buying materials that will sustain the productivity of the classroom. Classrooms lack basic materials that the teachers need. Many classrooms lack of enough books, art supplies and technology.

ICT Integration Support

Another factor structured in the study was the lack of ICT integration support. Teachers are reluctant in the change of K to 12 due to the fact that they don't have enough knowledge and formal training with regards to using information and communication technology. Also, the lack of facilities and equipment such as computers, the Internet, and electronic delivery systems such as radios, televisions, and projectors among others contribute to this factor.

Lack of Monitoring and Evaluation of Implementation

Teachers have also reluctance on the change of K to 12 on the perception that there is a lack of monitoring and evaluation about K to 12 among teachers, parents and students. This includes lack of government support, information, political will and human resources. Also, lack of budget from the government contributes to the difficulty of teachers in the implementation of K to 12 curriculum.

Learners' Readiness and Attitude towards Change

Another factor structured in the study why teachers have also reluctance on the change of K to 12 on the perception of the readiness and attitudes of the learners' to adapt to the new system due to lack of preparation. A lot of students just don't seem all that interested in learning. They don't think they can learn they often resist efforts that seek to make them learn. Learners resist changes because they think that having this new system is such a burden and other workloads will be added which lead to poor study habits and *absenteeism.*

Teachers' Readiness and Attitude towards Change

Teachers have also reluctance on the change of K to 12. The sixth factor pertains to the teachers' readiness and attitude to adapt to the new K to 12. Curriculum change has had direct impact on the roles and responsibilities of teachers more than any other constituency in our educational system. Teachers might actually feel threatened in a number of ways by the prospect of change.

Organizational Support

Teachers have also reluctance on the change of K to 12 on the perception that there is a lack of organizational support among teachers, parents and students. This includes administrative support, lack of orientation, opportunity for growth and development curriculum preparation.

Community and Parent Attitude towards Change

The last factor structured in the study was the community and parent attitudes towards change. Teachers are reluctant in the change of K to 12 due to the fact that they don't have enough support from the community or parents. Community and parents are very negative to take K to 12 curriculum because aside of the late orientation they already produce negative opinions about K to 12 which are very difficult to eradicate or to erase.

Conclusion:

This study concludes that teachers are reluctant in the implementation of a new curriculum due to some factors why teachers resist to change. Examples are that schools lack capacity and resources to support change, teachers seem to be having some difficulties in implementing some of the needs of new changes in curriculum because of the inadequacy in teaching and learning resources together with the infrastructure that can make the effectiveness of new changes a success in school, they don't have also enough knowledge and formal training with regards to using information and communication technology. Also, the lack of facilities and equipment such as computers, the Internet, and electronic delivery systems such as radios, televisions, and projectors, lack of monitoring and evaluation about K to 12 among teachers, parents and students, the readiness and attitude of learners as well as teachers, lack of organizational support among teachers, parents and students. This includes administrative support, lack of orientation, opportunity for growth and development curriculum preparation.

From the findings of the study, a grounded theory is formulated called **Reluctance to Change Theory** which states that teachers tend to be hesitant to adapt to change because of some factors that it affect in the process. There are two (2) elements in this theory the **RR** which stands for **Resources** and **Readiness**. First element is resources because how to implement if there's an adequacy of materials, lack of orientation, tools, equipment and infrastructure. Second is the readiness among teachers, learners and stakeholders. Not only the teachers but all the people who are involves in the implementation. When they are not ready then they are not sufficient, they don't have self-efficacy or not motivated to work.

Recommendations:

The following recommendations are derived from the findings and conclusions.

1. The government should help the schools in procuring the facilities and they should have a survey, they should let schools answer a survey's questionnaire about the facilities.
2. Teacher should be experts and must undergo trainings or seminars before they can teach subjects in the K to 12 curriculum.
3. Future researchers should conduct a study on the effectiveness of K to 12 after the implementation of the program.

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Phytoremediation Properties of Agathis Philippinensis Warb. in Mt. Hamiguitan, Davao Oriental

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Abstract

Philippines has one of the most rare type of forest- the bonsai forest or the mossy-pygmy forest. It is a forest with high concentration of metals and among these is pygmy forest found in Mt. Hamiguitan. Studies showed that high concentration of metals in soil leads to the reduction in plant growth and yield. This can also lead to food insecurity for the other species dependent on it. The objective of this study is to investigate the potential of *Agathis philippinensis* as a plant for hyperaccumulating heavy metals. Specifically, it aims to determine the heavy metals found in the leaf sample of *A. philippinensis* using Energy Dispersive Spectroscopy-Scanning Electron Microscopy (EDS-SEM) for quantitative analysis. Results showed elements found in the leaf are non-heavy metals which include calcium (0.13 mean weight %), carbon (72.16 mean weight %), oxygen, (27.69 mean weight %) and potassium (0.06 weight %). The *A. philippinensis* is believed to uptake and convert elements found in the serpentine soil into usable forms for its survival mechanism. This implies that *A. philippinensis* is an effective plant for bioremediation in metal-contaminated soils. The Researcher recommended mass production of *A. philippinensis* to remediate the metal-contaminated soil. Further examination of more leaf samples and other plant organs in more sampling sites within the studied pygmy forest is recommended to test the potential of *A. philippinensis* for phytoremediation and to validate the results of this study.

Keywords: *Almaciga, Bioremediation, Heavy metals, Phytoremediation*

Introduction

Philippines is blessed to have one of the most rare type of forest, the bonsai forest or the mossy-pygmy forest which can be found in Mt. Hamiguitan. A pygmy-forest has serpentine soil or ultramafic soil which is characterized by disproportionate amounts of magnesium (Mg) in relation to calcium (Ca) and often contained elevated concentrations of nickel (Ni) (Brooks, 1987). They can be generally distinguished by their reddish rocky soil and shrubby or growth-restricted vegetation. Chibuike and Obiora (2014) stated that high concentration of metals in soil leads to the reduction in plant growth and yield. This can also lead to food insecurity for the others species dependent on it.

In response with these metal-contaminated soils of Mt. Hamiguitan, an eco-friendly approach for natural and biological remediation may be used. Environmental issues such as these, the adoption of phytoremediation technologies for the plant-based clean-up of contaminated soils is a recognized solution (Kramer, 2005). Phytoremediation refers to a diverse collection of plant-based technologies that use either natural-occurring plants or plants that are genetically engineered for cleaning contaminated environments.

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Compared with soil remediation which comprises removal of contaminated soil followed by disposal on landfills or immobilization treatment of the contaminated soil or the conventional methods, the use of plants is safer. It is also a carbon dioxide neutral technology. Moreover, it is more convenient and above all cost-wise and effective (Peuke and Rennenberg, 2005). According to McGrath and Zhao (2003) the time it takes for plants to reduce the amount of contaminants in the soil depends on two factors; how much biomass these plants produce and the ratio of metal concentration in the shoot tissue to the soil. It can further determine the ability to accumulate, store and detoxify metals while maintaining metabolism, biomass production and growth (Clemens et al, 2000).

The selection of heavy metal tolerant species is a reliable tool to achieve success in phytoremediation. The best indicator for potential phytoremediation species are those plants that already grow around contaminated areas by heavy metals. These plants already possess the genetic potential necessary for survival in sites oppressed with contaminated and hazardous waste. Furthermore they can tolerate heavy metal–rich soil, have high biomass and fast growing (Cadiz, 2006). According to Mt. Hamiguitan Range Wildlife Sanctuary (MHRWS), the Almaciga (*Agathis philppinensis*) is one of the 27 species of conifers that reside in the pygmy forest of Mt. Hamiguitan. The presence of Almaciga in the bonsai field of Mt. Hamiguitan is intriguing because the natural habitat of this plant is the montane forest where the soil environment is not metal-rich. Almaciga is known for its uses as lumber or timber and for its resins for Manila copal (Richman, 2001). Its potential to accumulate metals is not well-studied.

In this light, the ability of Almaciga species for decontaminating the metalliferrous substrates in the ultramafic soil and its potential to facilitate the removal of metal contaminants from a soil matrix make the investigation of this process particularly interesting. Erosion of heavy metal contaminated soil can bring down heavy metal pollution from higher elevation to lower elevation gradient towards the reef that can threaten the stability of the environment. This problem on heavy metal contamination is an emerging problem that poses considerable environmental and social risks and concerns. The potential candidates for natural bioremediation such as plants are those plant groups that are not considered as main sources of food. Hence, the need to investigate a potential endemic or native plant that can be planted and grown for phytoremediation in heavy metal contaminated slopes.

The purpose of this study is to determine the suitability of Almaciga (*Agathis philippinensis*) for phytoremediation as a cost-effective method and natural, biological approach to remediate toxic heavy metals in soil. Specifically the study aimed to:

1. Determine the heavy metals present in the ultramafic soil;
2. Screen the presence of the heavy metals present in the leaf of *Agathis philippinensis;* and
3. Quantify the heavy metal present in the leaf of *Agathis philippinensis*.

Methodology

Mt. Hamiguitan is located in southern part of the Philippine Archipelago in the Island of Mindanao. The mountain has a height of 75-1,637 m above sea level and a protected area of approximately 2,000 hectares where the pygmy forest is located. It is part of Mt. Hamiguitan Range Wildlife Sanctuary (MHRWS) a proclaimed protected area created by virtue of RA 9303 last 2004. In 2009 it was submitted to UNESCO as world heritage site and is now included on the tentative list of UNESCO's World Heritage Site.

Opportunistic sampling method was employed in selecting three plant samples. One (1) kg of six plant and soil samples was taken from three Almaciga individuals in the bonsai forest. They are stored in autoclavable cellophane, air dried for 3 days and oven dried for 5 minutes then pulverized and sifted. Pulverized samples were put in zip lock plastic with silica gel and brought to laboratory for analysis. Samples have been analysed via energy dispersive spectroscopy on scanning electron microscope (EDS-SEM) to screen and determine the elemental composition of the specimen. Arithmetic mean was employed to determine the average weight percentage of elements carbon, oxygen and calcium found in analysis of the leaf samples, where;

RESULTS AND DISCUSSION

EDS spectrum analysis in all soil samples showed peaks with the presence of magnesium (Mg), aluminum (Al), silicon (Si), chromium (Cr) and iron (Fe). An addition of nickel (Ni) was found on soil sample 2 and manganese (Mn) in soil sample 3, while other heavy metals are below the detection limit. The presence of these heavy metals were similar to the results of Aribal et al. (2016) in Mt. Kiamo, Bukidnon which suggests an ultramafic or serpentine soil where the concentration of Fe is high.

The EDS analysis for Almaciga leaf samples detected the presence of carbon (C), oxygen (O) and calcium (Ca) in all samples and potassium (K) in sample 3. These are inorganic molecules naturally needed by the plants in optimum concentration. Ca is needed for the cell wall development while K is required to develop healthy leaves. The heavy metals present in the soil but below detectable range in the leaf sample indicates that Almaciga is a non-hyperaccumulator plant for Ni, Mg, Cr and Fe. In the report of Aribal et al. (2016), Almaciga is a good hyper-accumulator of copper (Cu) which is not present in the soil collected from the bonsai field. This suggests that Almaciga is hypertolerant species for the presence of Ni, Mg, Cr and Fe, and ratio of Ca:Mg is exhibited by its morphological characteristics. The ability of Almaciga to grow on this soil condition suggests the ability of the plant to phytoremediate by breaking down the toxic material into non-toxic form. This physiological process is known as phytometabolism. Quantitative analysis of the soil samples (Figure 1 A-C), with presence of carbon (C) and oxygen (O) (Figure 1 D-F), and leaf samples (Figure 1 G-I)

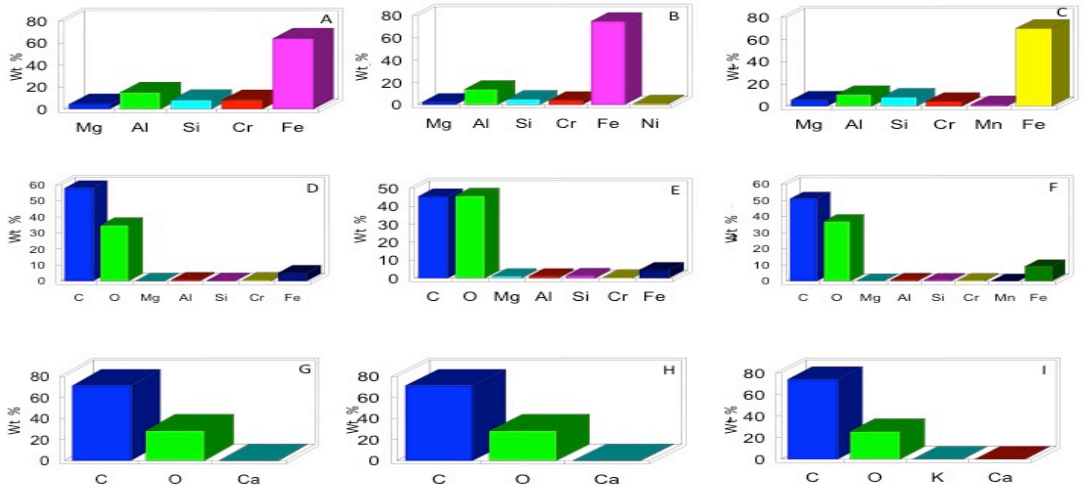

Figure 1. Quantitative analysis of soil (A) sample 1, (B) sample 2, (C) sample 3; soil sample with CO (D) sample 1, (E) sample 2, (F) sample 3; and Almaciga leaf (G) sample 1, (H) sample 2, (I) sample 3.

As observed in Graphs D, E and F (Figure 7) which shows the elements found in the serpentine soil, Carbon weight percentage in soil sample 1, 2 and 3 are 58.00%, 45.50% and 51.05%, respectively. But for the leaves sample 1, 2 and 3 the levels of carbon in terms of weight percentage is higher having 71.20%, 71.36% and 73.93% respectively. It can also be observed that the elements present in the soil such as Mg, Al, Si, Cr, Fe, Ni and Mn are not found in the elemental screening of the leaves samples. They are present at the images provided by the machine but these metals are below detection level for quantitative measurement or the elements present in the soil are converted by the plant into usable forms such as potassium (K) and calcium (Ca) where potassium (K) can stimulate protein production in plants and calcium (Ca) is an essential element for carrying or cell division in plants. The amount of carbon (C) in the leaf samples are higher than the carbon (C) levels in the soil could also imply that the elements found in serpentine soil are converted into more carbon (C) that can be used in many plant metabolism and other biological processes.

CONCLUSION AND RECOMMENDATION

Based on the findings of the study, there is a presence of heavy metals in the ultramafic or serpentine soil. These metals found in the serpentine soil include iron (Fe), aluminum (Al). magnesium (Mg), silicon (Si) chromium (Cr) nickel (Ni), manganese (Mn). Using leaf samples of *Agathis phiippinensis* to investigate its potential as a plant for phytoremediation using elemental analysis heavy metals was found absent, however, elements such as calcium (0.13 mean weight %), carbon (72.16 mean weight %), oxygen, (27.69 mean weight %) are identified. The *Agathis philippinensis* is believed to uptake and convert elements found in the serpentine soil into usable forms for its survival mechanism.

Therefore, there's enough evidence that there are heavy metals present in the ultramafic soil. Moreover, there is substantial evidence that there are heavy metals accumulated in the leaves of *A. philippinensis*. In conclusion, there is enough evidence that *A. philippinensis* is a potential plant for phytoremediation of metal-contaminated soil. The quantitative analysis using leaf samples showed the potentiality of *A. philippinensis* for phytoremediation technology, it is therefore recommended mass production of *A. philippinensis* be implemented. In addition, leaf samples and other plant organs in more sampling sites within the studied pygmy forest will be further examined to validate the results obtained in this study.

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Orthographic Projection Approaches: Effects to Students' Spatial Reasoning

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Abstract

In this study, the 2D multimedia presentation and 3D interactive video on orthographic projection were used to evaluate how these methods affect student attitudes on technical drafting and to students' spatial reasoning performance of second year college students.

The pre-experimental research design was utilized to determine the effectiveness of orthographic projection methods in improving students' spatial reasoning performance. However, quasi-experimental design was used to determine the effectiveness of orthographic projection methods on student attitudes towards technical drawing in the pretest ad posttest. Two intact classes were used in this study, the 2D group which used Multimedia presentations and the 3D group which used interactive video respectively.

Findings observed on this research were: (1) Both the 2D and 3D participants have favorable attitudes in the posttest in technical drawing as a subject, learning technical drawing, frequency of use and technology as a future job. (2) There is no significant difference between the 2D and 3D groups in terms of their attitudes towards technical drawing and their performance in the final spatial reasoning assessment success rates on mental rotation and object visualization test.

Results indicated that using 2D and 3D approaches in teaching orthographic projection had the same effects in improving students' spatial reasoning performance. Technology teacher must use ICT enhanced media in discussing the orthographic projection concepts as it help improve students' performance and develop attitudes towards technical drawing. A combination of 2D Multimedia and 3D interactive video will be most effective methods in discussing orthographic concepts but not in isolation.

Keywords: *ICT, Orthographic Projection, Spatial Reasoning, Student Performance*

Introduction

Designing an effective and engaging instruction in a big class remains the most complex task a technology teacher must surmount. Discussion of a topic or words are very complex because its meaning are not in the word itself, they are defined based on the mindset of the learners. Henceforth, a technology teacher is often challenge on how to effectively

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communicate to his students the basic principles and theories in orthographic projection and pictorial drawing that will teach students how to read and convey information through lines and dimensions. When combined with dimensions, multi-view drawings will serve as the main form of communication between designers and manufacturers. It is through accurate orthographic projection drawing, a draftsman express to the builder the necessary information to construct a structure. Furthermore, teachers undertaking of educating big classes in a lower section is another dispute. Hence, drafting technology teachers should keep him updated with the latest instructional media to make discussion interesting and engaging as students nowadays are more interested in computers and internet.

Effective instruction of spatial reasoning concepts is vital to every Drafting Technology students as future draftsman. Spatial reasoning skills are utilized often when reading or developing designs for fabrication in technology education and engineering classes. Isometric samples do have their place in spatial reasoning conceptual teaching methods; however they should not be the primary method of instruction for teaching these concepts (Ligocki, 2011).

The integration of technology and utilization of instructional media advancement plays a critical task to bridge the gap in the classroom learning process. It allows the teacher to discuss abstract topics easily and meaningfully. ICT integration in the classroom provides an enjoyable and engaging learning activity to impart effectively and efficiently the abstract concepts.

Based on scientific findings, constructivism has been effective method over traditional instruction. It allows the students to actively participate in the learning process, and construct new understanding from the previous knowledge. If students could integrate these concepts in their spatial reasoning ability, they would be able to recognize the implications of Orthographic Projection to their higher major subjects; hence, they will develop love and interest towards the subject.

Inclined with this, the researcher will design both the three- dimensional (3D) method and two-dimensional (2D) multimedia presentation method as an aid to help drafting teachers explain the concept of multi-view drawing. The researcher aim that through this developed media, the pupils will experience different methods to have purposeful explanation of multi-view drawing. Three- dimensional (3D) method and two-dimensional (2D) multimedia presentation method will be evaluated if it will help develop student's spatial reasoning performance in drawing subjects.

This study aimed to investigate the effects of orthographic projection approaches in developing spatial reasoning performance of the Industrial Technology students at MSU-Iligan Institute of Technology. This study aimed to answer the following questions: (1) what is the performance of the students in drawing examination? (2) What is the attitude of the students in engineering drawing before and after they have experienced the 2D and 3D orthographic approaches? (3) Is there a significant difference between the performance of the students when grouped according to the teaching strategy, 2D and 3D approaches in teaching students spatial concepts? (4) Is there a significant difference between the attitude of the students when grouped according to the teaching strategy, 2D and 3D approaches in teaching students spatial concepts?

1. Main Body

1.1 Figures and Tables

Table 1
Performance of Students in Drawing Examination

Topics	2D		3D	
	Mean	SD	Mean	SD
1. Orthographic Sketching	11.17	3.85	12.41	2.37
2. Orthographic Projection	6.48	2.83	5.47	2.45
Average	8.83	3.34	8.94	2.41

Table 1 showed that group exposed to the 3D approach (12.41) performed higher than students in the 2D method (11.1739) in orthographic sketching exercises. It was revealed that the group using the 2D method (6.48) scored higher than the 3D group (5.47) in the orthographic projection in exercise sheet scores. On the other hand, the 3D group had an average mean of 8.94 which was slightly than 2D group with average mean of 8.83.

Table 2
Attitudes of the Respondents toward Learning Technical Drawing Subject Using the 2D Approach

	PRE-TEST			POST-TEST		
	Mean	SD	Description	Mean	SD	Description
1. I am very good at drawing.	2.83	1.07	Not Certain	2.94	0.90	Not Certain
2. I usually do well in technical drawing subject.	2.91	1.00	Not Certain	2.82	0.88	Not Certain
3. I like to take more drawing subjects in school.	3.00	1.21	Not Certain	3.24	1.20	Not Certain
4. Technical drawing is the most difficult skills.	2.87	0.92	Not Certain	3.18	1.29	Not Certain
5. I enjoy learning drawing and sketching.	3.61	0.94	Agree	3.65	0.86	Agree
6. Drawing and sketching is not one of my strengths.	3.09	0.95	Not Certain	2.76	1.25	Not Certain
7. Waiting to have my drawing plates returned make me nervous.	3.52	0.99	Agree	3.18	1.33	Not Certain
Average	3.12	1.01	Not Certain	3.11	1.10	Not Certain

Table 2 reveals the attitudes of the 2D respondents towards learning technical drawing subject. It reveals that the participants in pretest were not certain in their attitude toward technical drawing as evidenced in their mean of 3.12. This implies that the participants were not certain on their drawing skills.

Table 3
Attitudes of the Respondents towards Technical Drawing Using 2D Approach

	PRE-TEST			POST-TEST		
	Mean	SD	Description	Mean	SD	Description
1. I think learning drawing and sketching will help me in my daily life.	3.87	0.76	Agree	3.82	1.01	Agree
2. I need technology to learn other school subjects.	4.09	0.79	Agree	3.88	0.99	Agree
3. I need to do well in technical drawing to get into the university or college of my choice.	3.13	0.97	Not Certain	3.35	1.17	Not Certain
4. I like job that involves technical drawing.	2.74	0.96	Not Certain	2.94	1.09	Not Certain
5. I will participate if the school has an art/drawing club.	2.83	1.15	Not Certain	3.06	1.34	Not Certain
6. Technical drawing subjects improved my drawing skills.	3.70	0.70	Agree	4.12	0.78	Agree
7. Technical drawing skills helps in seeking for job I want	3.30	0.76	Not Certain	3.88	0.86	Agree
Average	3.38	0.87	Not Certain	3.58	1.04	Favorable

Table 3 shows the 2D respondents attitude towards technical drawing. It reveals that most of the responses of the participants in both pretest and posttest did not vary as the average values 3.38 and 3.58 shows a favorable attitude. This implies that the participants were positive to learn more in technical drawing as they realized that this subject is needed for their future job.

Table 4
Attitudes of the respondents towards the frequency of applying in the technology lessons using 2D Approach

	PRE-TEST			POST-TEST		
	Mean	SD	Description	Mean	SD	Description
1. I often apply my learning for technology to my daily life.	3.61	0.78	Agree	3.88	0.93	Agree
2. I often talk about the types of jobs and careers that use technology	3.65	0.83	Agree	3.65	1.00	Agree
Average	3.63	0.81	Favorable	3.76	0.96	Favorable

Table 4 reveals the 2D group attitude towards the frequency of applying in the technology lessons. It shows that the often apply the learning's in technology for their daily life and such talk about type of jobs and careers that use technology. This implies that the participants believe that technology is necessary in their daily life.

Table 5
Attitudes of the Respondents towards Technology as future Job Using 2D Approach

	PRE-TEST			POST-TEST		
	Mean	SD	Description	Mean	SD	Description
I. Drafting Technology is a very important profession.	4.09	0.79	Agree	4.24	0.66	Agree
2. Drafting teachers do lots of interesting things.	3.96	0.71	Agree	4.35	0.61	Agree
3. Being a drafting teacher can be exciting.	3.78	0.67	Agree	3.94	0.75	Agree
4. Drafting teacher is a good career cultural minority.	3.65	0.65	Agree	4.06	0.83	Agree
5. Drafting teachers really enjoy their work.	3.70	0.63	Agree	4.24	0.66	Agree
6. Drafting teachers have fun in their jobs.	3.74	0.69	Agree	4.06	0.66	Agree
7. Drafting teachers are satisfied of their jobs.	3.78	0.74	Agree	4.00	0.79	Agree
8. Going to an education in college is enjoyable and exciting.	4.22	0.74	Agree	4.29	0.69	Agree
9. Having drawing skill is important for me to be successful in life.	4.04	0.71	Agree	4.06	0.97	Agree
10. Drafting teachers can do many things.	3.87	0.63	Agree	3.94	0.83	Agree
11. Drafting teachers is something that can change life style.	3.61	0.66	Agree	3.82	0.73	Agree
12. I like to become an engineer.	3.04	1.07	Not certain	3.47	1.01	Not certain
13. I like to go to an engineering college after high school.	2.96	1.07	Not certain	3.29	1.05	Not certain
14. Like to go to engineering college.	3.09	1.28	Not certain	3.29	1.40	Not certain
15. I like to enroll in Drafting Technology course in college after high school.	2.78	1.09	Not certain	3.24	1.20	Not certain
Average	3.62	0.81	Favorable	3.89	0.85	Favorable

Table 5 shows the attitude of the students using the 2D Approach towards technology as their future job. The 2D participants have favorable attitude with regards to technology as their future job as evidenced in the mean 0f 3.62 and 3.89 in the pretest and posttest respectively. There is an increase attitude on all items. This implied that the participants believe that being a drafting teacher can be a rewarding profession but they were not sure to become an engineer as their profession since they already have their chosen course as of this time.

Table 6
Attitudes of the Respondents towards Learning Technical Drawing Subject using3D Approach

	PRE-TEST			POST-TEST		
	Mean	SD	Description	Mean	SD	Description
1. I am very good at drawing.	3.22	1.04	Not certain	3.38	0.89	Not certain
2. I usually do well in technical drawing subject.	3.09	1.16	Not certain	3.31	0.95	Not certain
3. I like to take more drawing subjects in school.	3.48	0.95	Not certain	3.88	0.89	Agree
4. Technical drawing is the most difficult skills.	3.39	1.08	Not certain	3.06	1.00	Not certain
5. I enjoy learning drawing and sketching.	3.61	0.94	Agree	4.13	0.62	Agree
6. Drawing and sketching is not one of my strengths.	3.74	0.81	Agree	3.31	1.08	Not certain
7. Waiting to have my drawing plates returned make me nervous.	3.61	0.99	Agree	3.00	0.89	Not certain
Average	3.45	1.00	Agree	3.44	0.90	Agree

Table 6 disclosed the 3D attitudes towards learning technical drawing subject. It reveals that the participants' response from pretest (3.45) to posttest (3.44) does not vary much as the average shows a difference of 0.01. This symbolized that there is a need for more drawing subjects since drawing is vital in their course.

Table 7
Attitudes of the Respondents towards Technical Drawing using3D Approach

	PRE-TEST			POST-TEST		
	Mean	Sd	Description	Mean	Sd	Description
1. I think learning drawing and sketching will help me in my daily life.	3.91	0.73	Agree	3.94	0.85	Agree
2. I need technology to learn other school subjects.	3.87	0.92	Agree	4.13	0.81	Agree
3. I need to do well in technical drawing to get into the university or college of my choice.	3.35	1.07	Not certain	3.38	0.81	Not certain
4. I like job that involves technical drawing.	3.22	0.95	Not certain	3.56	0.89	Agree
5. I will participate if the school has an art/drawing club.	3.26	0.96	Not certain	3.38	1.15	Not certain
6. Technical drawing subjects improved my drawing skills.	3.48	0.90	Not certain	3.94	0.68	Agree
7. Technical drawing skills helps in seeking for job I want	3.39	0.72	Not certain	3.63	0.62	Agree
Total	3.50	0.89	Favorable	3.71	0.83	Favorable

Table 7 denoted the attitude of the 3D group towards technical drawing. It reveals that the average pretest (3.50) and posttest (3.71) response does not vary, both agree on statement about technical drawing.

Table 8
Attitudes of the Respondents towards the frequency of applying in the Technology Lessons using 3D Approach

	PRE-TEST			POST-TEST		
	Mean	Sd	Description	Mean	Sd	Description
1. I often apply my learning for technology to my daily life.	3.50	0.70	Agree	3.78	0.97	Agree
2. I often talk about the types of jobs and careers that use technology	3.48	0.73	Agree	3.88	0.81	Agree
Total	3.52	0.67	Favorable	3.69	1.14	Favorable

Table 8 displays the 3D group attitude towards the frequency of applying in the technology lessons. It shows that respondents were favorable both in the pretest and post-test that they often apply the learning's in technology for their daily life and such talk about type of jobs and careers that use technology.

Table 9
Attitudes of the Respondents towards Technology as future Job using3D Approach

	PRE-TEST			POST-TEST		
	Mean	Sd	Description	Mean	Sd	Description
1.Drafting Technology is a very important profession.	4.09	0.79	Agree	4.19	0.66	Agree
2. Drafting teachers do lots of interesting things.	4.09	0.67	Agree	4.31	0.79	Agree
3. Being a drafting teacher can be exciting.	4.36	10.72	Agree	4.06	0.77	Agree
4. Drafting teacher is a good career cultural minority.	3.87	0.81	Agree	4.06	0.77	Agree
5. Drafting teachers really enjoy their work.	4.00	0.60	Agree	4.25	0.58	Agree
6. Drafting teachers have fun in their jobs.	3.96	0.64	Agree	4.31	0.60	Agree
7. Drafting teachers are satisfied of their jobs.	3.83	0.65	Agree	4.00	0.73	Agree
8. Going to an education in college is enjoyable and exciting.	3.91	0.73	Agree	4.38	0.72	Agree
9. Having drawing skill is important for me to be successful in life.	3.83	0.89	Agree	4.19	0.66	Agree
10. Drafting teachers can do many things.	3.96	0.82	Agree	4.19	0.83	Agree

11. Drafting teachers is something that can change life style.	3.70	0.76	Agree	4.25	0.68	Agree
12. I like to become an engineer.	3.61	0.94	Agree	3.88	0.72	Agree
13. I like to go to an engineering college after high school.	3.09	1.16	Not Certain	3.69	1.01	Agree
14. Like to go to engineering college.	3.35	0.98	Not Certain	3.50	0.82	Agree
15. I like to enroll in Drafting Technology course in college after high school.	3.48	0.99	Not Certain	3.75	0.93	Agree
Total	3.81	1.48	Favorable	4.07	0.75	Favorable

Table 9 reveals the 3D group attitude towards technology as future job. It showed that the average response does not differ in the pretest (3.81) and posttest (4.07) which denotes that participants were favorable on technology as their future job. All the scores slightly increased in the posttest after the treatment.

Table 10

Comparison of Students Performance in Final Spatial Reasoning Assessment Success Rates on Mental Rotation and Object visualization Test

Group	N	Mean Rank	Sum of Ranks	Mann-Whitney U Score	Probability
2D	23	21.09	485.00		
3D	17	19.71	335.00	182.00	.725
Total	40				

Table 10 shows the comparison of students performance in final spatial reasoning assessment success rates on mental rotation and object visualization Test. It reveals that the 2D group has higher mean rank of 21.09 compared to that of the 3D group with a mean of 19.71. Mann Whitney u Test is utilized to compare the performance in the final spatial reasoning assessment success rates on mental rotation and object visualization. Mann Whitney U Score is 182 with probability value of .725 is greater than 0.05, hence there is no sufficient evidence to reject Ho. There is no significant difference between 2D and 3D in terms of performance in final spatial reasoning assessment success Rates on mental rotation and object visualization test.

This implies that the use of 2D and 3D approaches are of the same effects in the final spatial reasoning assessment success rates on mental rotation and object visualization test.

The participants in the 3D group were not focused on the concept and principles of orthographic projection with 3D flash interactive animation while the 2D participants were more accustomed with multimedia presentation. The result is consistent to the study of Herrera (1998), which reveals that the students are more interested in learning CAD system but paying less attention to the basic engineering concepts and 3D visualization techniques. Moreover, Multimedia presentation also included an animation rendered that made the approach more informative and effective compared to 3D methods.

This contradicts to Ligocki (2011) study on spatial reasoning ability where 3D methods have greater impact to student performance. Students in 3D group may not be fully equipped to adapt the new computer aid application for learning. The 3D software should be

available to students at any time to give the students time to review their learning at their convenient time and pace. Most likely the result affects not having the actual experience of the learners to use the software. Only the teacher manipulates the software due to the limited number of computer in the laboratory.

Table 11
Comparison of students' performance in final spatial reasoning assessment success rates on orthographic projection test

Group	N	Mean Rank	Sum of Ranks	Mann-Whitney U Score	Probability
2D	23	21.78	501.00		
3D	17	18.76	319.00	166.00	.432
Total	40				

Table 11 shows the performance of the students in final spatial reasoning assessment success rates on orthographic projection test. It reveals that 2D group has mean rank of 21.78 which is higher than the 3D group with a mean of 18.76 only.

The Mann Whitney u Test is utilized to compare the performance in the final spatial reasoning assessment success rates on mental rotation and object visualization. Mann Whitney U Score is 166 with probability value of .432 is greater than 0.05, hence there is no sufficient evidence to reject Ho. There is no significant difference between 2D and 3D approaches in the performance in the final spatial reasoning assessment success rates on orthographic projection test.

Table 12
Comparison of Students Attitude in 2D and 3D methods in learning technical drawing

Group	N	Mean Rank	Sum of Ranks	Mann-Whitney U Score	Probability
2D	23	19.72	453.50		
3D	17	21.56	366.50	177.50	.626
Total	40				

Table 12 shows the comparison of attitude of students when grouped according to the teaching approach, 2D and 3D approaches in learning technical drawing. It reveals that the 3D group had a higher mean rank of 21.56 score higher in attitudes towards technical drawing than 2D group having 19.72 mean.

In this study, Mann Whitney U test was utilized to compare the attitude of students when grouped according to the teaching strategy in learning technical drawing. The Mann Whitney U Score is 177.50 with a probability value of .626 is greater than 0.05, hence, there is no sufficient evidence to reject Ho that there is no significant difference between the 2D and 3D approaches in improving attitude of students when grouped according to the teaching strategy, 2D and 3D approaches in learning technical drawing.

Participants administered with 3D methods were more motivated and positive with learning the technical drawing subject. In this study the participants do not have the chance to use and manipulate the multimedia due to lack of computer in the CAD laboratory that

affects the performance of the students.

Table 13
Comparison of Students in the Attitudes towards the frequency of applying in the Technology Lessons.

Table 13 showed the comparison of students' attitude when grouped according to teaching strategy, the 2D and 3D approaches towards the frequency of applying technical drawing. It reveals that 3D group with mean rank of 20.94 were almost the same in attitudes towards technical drawing with 2D group having a mean of 20.17.

The Mann Whitney u test is utilized to compare the attitude students when grouped according to the teaching strategy, the 2D and 3D approaches towards frequency of applying technical drawing. The Mann Whitney U Score is 188 with a probability value of .850 is greater than 0.05, hence there is no sufficient evidence to accept Ho. There is no significant difference between 2D and 3D in terms of attitude when grouped according to the teaching strategy, the 2D and 3D approaches towards the frequency of applying technical drawing.

Table 14
Comparison of students in the attitudes towards technology as future Job

Group	N	Mean Rank	Sum of Ranks	Mann Whitney U Score	Probability
2D	23	20.83	479.00	188.00	.850

Group	N	Mean Rank	Sum of Ranks	Mann-Whitney U Score	Probability
2D	23	20.17	464.00		
3D	17	20.94	356.00	188.00	.850
Total	40				
3D	17	20.06	341.00	188.00	.850
Total	40				

Table 14 shows the comparison of students' attitude when grouped according to the teaching strategy, the 2D and 3D approaches towards the frequency Technology as future job. It revealed that the 2D group has mean rank of 20.06 with almost the same attitudes towards technical drawing with 3D group having a mean of 20.83.

The Mann Whitney u Test was utilized to compare the attitude students when grouped according to the teaching strategy, the 2D and 3D approaches towards attitude toward technology as future job. The Mann Whitney U Score is 188 probability value of .850 is greater than 0.05, hence there is no sufficient evidence to reject Ho. There is no significant difference between 2D and 3D in terms of attitude when grouped according to the teaching approaches towards the frequency Technology as future job.

2.2 Formula and Equation

To know the spatial reasoning ability of the students, the researcher used the pre experimental research approach with static-group comparison research design. This is a design where two intact groups are tested after one has received the treatment. After one

group receives the treatment, all groups were given posttest.

On the other hand, to measure students' attitudes towards technical drawing, the researcher used the quasi-experimental research approach. The pre-test and posttest design was used. Subjects were tested in existing or "intact" groups rather than being randomly selected. The dotted line in the diagram represents "non-equivalent" groups. Both groups were measured before and after treatment. One approach to measuring the significance of difference between the two groups is to compute gain scores. This is done by subtracting the pre-test score from the post-test score for each subject. Used gain scores to compute average gain for each group.

O 1 X O 2

O3 O4

Where:
O1 = 2D Group Scores before the implementation of the Approach
O2 = 2D Group Gain Scores after the implementation of the Approach
O3 = 3D Group Scores before the implementation of the Approach
O4 = 3D Group Gain Scores after the implementation of the Approach

Two instructional methods were utilized in this experiment. The first approach involved 2D isometric multimedia representation lessons. Though the presentation was in 2D, the presentation was incorporated with animations and effects. The second approach involved 3D software object modeling lessons, where ADOBE Macromedia Flash was a requirement to run the 3D software.

A final assessment was administered to evaluate which of these learning processes was the most effective approach in teaching orthographic projection concepts that developed students' spatial reasoning. Attitude questionnaire was also administered in the before and after the treatment to know if there was a change of attitude of the students towards technical drawing after the administration of the two approaches.

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The Essential Review of Component for Thai Youths in The 21st Century

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Abstract

In the current situation Thailand was experiencing rapidly with social, cultural, political, economic and technological changes. The elevation of enhancing academic achievement and empowering people to competitiveness in world economy of the 21st century. On the basis of Thai and sufficiency economy philosophy to fully understand Thai identity of long life sustainable. Thailand needs to develop manpower to be standardized against ASEAN or international also prepare youths people for life skills in the 21st century. The researcher found the appropriate components by studying and analysing the documents (Content analysis). From the study found that the essential components and essential to living in the 21st century for Thai youths were: 1) Thainess 2) Sufficiency Economy 3) Five Minds of the Future and 4) Basic knowledge 5) Core Subjects 6) 21st century skills.

Keywords: Thai Youths, The 21st Century, Essential Components, Content Analysis

Introduction

The 21st century is considered the transforming age changing from the traditional socioeconomic society based on sufficiency to the one based on information technology focusing on consumption and materialism. This change has also affected the new type of education among young learners predicated on the exponentially growing field of Information Technology (IT). This information is not limited to just the printed media but also to the various forms of multimedia that are more conveniently accessible than in the past. The conventional learning methods cannot answer the needs of the contemporary learners bombarded by the advent and continuous development of such digital media as the computer, the Internet, the mobile phone and tablet, etc. It is, therefore, important to bridge this learning gap and adjust the methods for more effective learning that can turn people into lifelong learners.

The National Economic and Social Development Project No.12 (2017-2021) focuses on this much-needed adjustment to make people more physically, intellectually, emotionally and morally ready for this transformation and allows children to have all the necessary skills and knowledge for survival deemed important for the sustainable development of the country.(Office of the National Economics and Social Development Board. 2016) Such a perspective is congruent with the policy of the Ministry of Education in preparing youths for the 21st century and in promoting in them ethics, nationalism, analytical thinking, creativity, technological and collaborative skills with others. (Ministry of Education. 2008)

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The Ministry must be ready to prepare the workforce and develop the potential of people of all ages in the hopes of turning them into qualified individuals and must make sure that they follow the good social norms, the future scientific and technological transformation, and the educational and healthcare upgrades. All of these are important for the labor market in the 21st century. (Office of the National Economics and Social Development Board. 2016) With regard to the lifestyle problems among youths in the 21st century, the researcher has studied, researched, analyzed and synthesized facts and factors necessary for survival in the 21st century.

Research Objectives

The aim of this research is to gain insight into the essential components for Thai youths in the 21st century.

Literature Review

The researcher has reviewed documents and perspectives regarding skills necessary for the development of Thai youths and readiness for the digital age 4.0 in the 21st century. (Ministry of Industry. 2016) The National Economic and Social Development Project No.12 (Office of the National Economics and Social Development Board. 2016) The national education development of the Ministry of Education No.12 (Ministry of Education. 2016) The core curriculum of basic education 2008 (Ministry of Education. 2008) The Philosophy of Sufficiency Economy (Office of the National Economics and Social Development Board. 2007) 21st century skills (Partnership for 21st Century Skills, 2017; Bellanca & Brandt, 2010; Trilling & Fadel, 2009) and Five Minds of the Future Gardner (2007) including related documents and research for Thailand 4.0 in order to drive Thailand to be a country of wealth, stability and sustainability. (The Secretariat of the House of Representatives. 2016) From the literature review, the researcher is able to summarize the theoretical framework as follows:

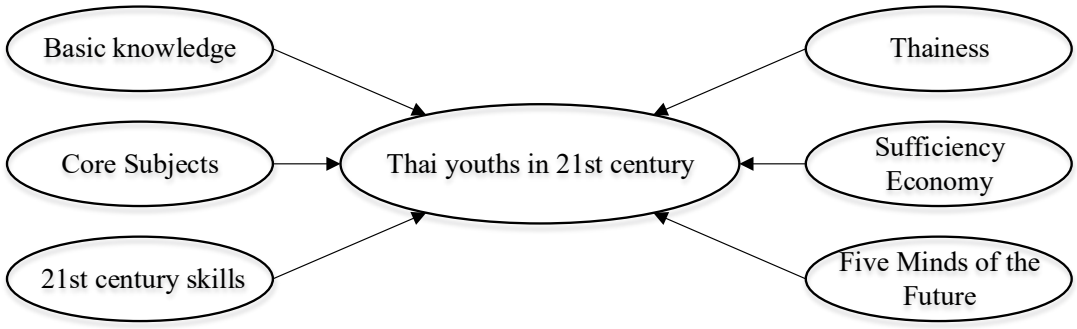

Figure 1 Theoretical Framework

Research Methodology

This research is a synthesis of documents as shown below:

Data Analysis: The data are collected from books, research work, academic articles, newspaper articles and interviews between 2009 and 2017. These work pieces feature the ideas of preparing Thai youths to be ready for the lifestyle changes in the 21st century.

Research device: Documents form are used in gathering information from all the documents.

Data analysis: The research is based on Content Analysis in garnering, arranging, making inferences, summarizing and categorizing all the important issues in the forms of compositions and discussion tables.

Results

After analysing all the documents, the researcher has come up with six essential components necessary for Thai youths to live their lives in the 21st century.

1. Thainess

The core curriculum of basic education 2008 aims to develop Thai youths of all levels to be physically fit and conscientious under the constitutional monarchy. They should be knowledgeable, skillful, and continuously updating their knowledge to fit in with the constantly changing society. The curriculum also zeroes in on developing youths to be intellectual, happy and potentially qualified to work and study all their lives as shown in Table 1. (The Ministry of Education. 2008)

Table 1 The core curriculum of basic education 2008

The core curriculum of basic education 2008	
Objectives	The curriculum focuses on developing youths to be intellectual, happy and potentially qualified to work and study all their lives. Upon their completion, they should: 1) have ethics, desired values, discipline, religious and economic sufficiency principles. 2) have knowledge and abilities to communicate, think, solve problems, and use technology and life skills. 3) have good physical and emotional health and love exercises. 4) be nationalistic and realize that they are the citizens not only of Thailand but also of the world under the constitutional monarchy. 5) be aware of the preservation of cultural and intellectual wisdom, environmental conservation and development as well as social responsibilities.

The core curriculum of basic education 2008	
Competency of Learners	The core curriculum of basic education is designed to develop five abilities among learners as follows: 1) Communicative ability: Students must be able to communicate language and culture, understanding, feelings and opinions for the sake of themselves and social development. They should also be good at negotiations, conflict resolutions, and information selection by thinking about how each action affects themselves and society. 2) Intellectual ability: Students should be able to think critically, creatively, discreetly and systematically to form a body of knowledge or utilize information technology to make sound decisions for themselves and society. 3) Problem-solving ability: Students should be able to resolve problems and overcome obstacles based on rationality, morality and IT knowledge. They should understand the relationships and changes of different events in society and seek for knowledge and apply it in problem preventions and resolutions. 4) Ability to use life skills: Students should be able to use life skills for self learning, continuous learning, collaborating with others for better interpersonal relationships, appropriately resolving conflicts and avoiding contemptible behavior towards others. 5) Ability to use technology: Students should be able to choose different types of technologies for their own and social development in learning, communicating, working, and appropriately resolving problems.

The core curriculum of basic education 2008	
Desired Characteristics	The core curriculum of basic education aims to develop learners to have desired characteristics, to be able to fit in with others happily as citizens of Thailand and the world, as follows: 1) loving their country, religion(s), and the royal family 2) embracing honesty 3) being disciplined 4) being thirsty for knowledge 5) upholding self-sufficiency 6) being work oriented 7) loving Thainess 8) caring for others
Learning Yardstick	In order to develop well-roundedness, it is important to keep in mind the cognitive development and polymathy. The core curriculum of basic education, thus, focuses on eight subject areas: 1) the Thai language 2) mathematics 3) science 4) social sciences, religions and cultures 5) health and physical education 6) art 7) vocation and technology 8) foreign languages

2. Sufficiency economy

All the speeches on the topic of sufficiency economy given by King Rama 9 and publicized on 29 November 1999 were meant to be guidelines for all sides to survive globalization as well as other changes and live sustainably as a result. The philosophy of sufficiency economy is used as a guideline to live the middle path fitting the simple lifestyle of Thai people of all levels, be it individuals, families, communities, organizations and even the country as a whole. Sufficiency refers to moderation and rationality. It is necessary to be immunized against all kinds of impacts, both external and internal. It takes wisdom, caution and carefulness to plan every step of the way and raise conscience, patience, intellect among state authorities, theorists and businessmen at all levels to be ready to handle the fast changes from the outside world. The main components of the King's speeches, according to the Office of the National Economics and Social Development Board (2007), are shown in Table 2

Table 2 The Philosophy of Sufficiency Economy

The Philosophy of Sufficiency Economy	
Sufficiency	It refers to the adequacy of what people need according to their status, environment and local culture. It must not be too much or too little and without troubling others.
Rationality	It refers to decisions made in accordance with the academic, legal, moral, and cultural principles. Makers of these decisions must anticipate future consequences carefully.
Immunity	It refers to preparing for the impacts caused by the economy, society, environment as well as internal and external cultures by using ethics, academics and rules of life. • Ethics helps people to be honest, harmonious, unselfish, and generous. • Academics helps people to apply their knowledge in planning and executing with caution. • Rules of life helps people to live their lives with patience and wisdom through the use of academic and moral principles.

3. Five Minds of the Future

Howard Gardner, a scholar in education from Harvard university, proposed five minds of the future. If people were to survive the 21st century, they could not live without any one of them. These are: 1) Disciplined Mind 2) Synthesizing Mind 3) Creating Mind 4) Respectful Mind and 5) Ethical Mind

Those without the disciplined mind will not succeed in their work and are confined to trivial jobs. Those without synthesizing mind cannot make correct decisions regarding work and people. Those without creating mind will be replaced by computers and creative people. Those without respectful mind do not deserve respect from others and might even pose a threat at work and in public. Those without ethical mind will deprive the world of honest and responsible citizens. Gardner believes that only those with all the five minds can survive the world dominated by science and technology, the influx of information, computers and robots. Gardner (2007)

Table 3 **Five Minds for the Future**

Five Minds for the Future	
Disciplined Mind	It refers to the expertise people gain from teaching and learning, autodidacticism, continuous training to the point that they can apply what they have learned in their work and lives. (Office of the Civil Service Commission. 2008a)
Synthesizing Mind	It refers to the ability to analyze and summarize information from various sources and reorganize them in the useful manner. It also includes separating facts from fiction without bias and carefully selecting information (Office of the Civil Service Commission. 2008b)
Creating Mind	It refers to the ability to create innovative and unique pieces of work through data collection, past experiences, observations, independent thoughts, imaginations, enthusiasm and determination. (Office of the Civil Service Commission. 2008c) This ability can also be expressed through elocutions or new pieces of work showing originality, flexibility and meticulousness.
Respectful Mind	It refers to respecting others, being able to differentiate between individuals and groups, and being willing to listen to different opinions as well as spending time with others in society happily. (Office of the Civil Service Commission. 2008d)
Ethical Mind	It refers to behaving morally or in accordance with the household, school or societal protocols. People should also be responsible for themselves and society, willingly take part in social activities, reduce social problems and be good citizens. (Office of the Civil Service Commission. 2008e)

4. Basic Education

Basic education for living through the 21st century (Bellanca & Brandt, 2010; Bellanca & Brandt, 2011) includes

1) Global Awareness
2) Financial, Economic, Business and Entrepreneurial Literacy
3) Civic Literacy
4) Health Literacy
5) Environmental Literacy

5. Core Subjects

The core subjects and skills for living through the 21st century are 1) English, Reading or Language Arts 2) World Languages 3) Art 4) Mathematics 5) Economics 6) Science 7) Geography 8) History 9) Government and Civics Bellanca and Brandt (2010)

6. 21st century skills

In America, there's a movement to form an organization for training people the skills they must know for the 21st century called Partnership for 21st Century Skills or P21. Bellanca and Brandt (2010) This organization feels that children need to be equipped with skills that are different from those of the 19th and 20th centuries and have developed vision and new learning frames in response to this change.

Professor Vicharn Panich reasons that Thailand needs to come up with a new educational strategy that focuses on pragmatics that allows people to live their lives in the real world. Learning must come with hands-on training, and people need to train these necessary skills all their lives. Panich (2012)

Thus, the aim of developing the Thai educational system this century must be directed at co-learning by both teachers and students as well as focusing on the processes rather than the knowledge or answers Panich (2013) by using the 21st century skills developed by the Partnership for 21st Century Skills. These three skills are shown in Table 4 (Partnership for 21st Century Skills. 2009)

Table 4 21st century skills

21st century skills	
Learning and Innovation Skills	**Creativity and Innovation** - thinking creatively - collaborating with others creatively - using innovations **Critical Thinking and Problem Solving** - thinking rationally - thinking systematically - considering and making decisions - solving problems **Communication and Collaboration** - communicating clearly - collaborating with others

21st century skills	
Information, Media, and Technology Skills	**Information Literacy** - accessing and assessing information technology - using and organizing information technology **Media Literacy** - analyzing media, - using media byproducts **Information and Communications Technology (ICT) Literacy** - maximizing the use of information technology
Life and Career Skills	**Flexibility and Adaptability** - adapting and being flexible **Initiative and Self-Direction** - targeting and timing - working independently - self-teaching **Social and Cross-Cultural Skills** - interacting with others - working efficiently even in different teams **Productivity and Accountability** - managing projects - producing results **Leadership and Responsibility** - leading others, - being responsible for others

Discussion

From the research on skills necessary for Thai youths to survive the 21st century and for their readiness to enter into Thailand 4.0, the researcher has found the following essential components: 1) Thainess 2) Sufficiency Economy 3) Five Minds of the Future 4) Basic knowledge 5) Core Subjects and 6) 21st century skills. The result will be given to experts at teaching and designing curricula, researching and developing education, measure and evaluation education, developing educational technology for further examinations, affirmation and credibility of the study.

Recommendation

1. Thai youths should be inculcated in morality, Thainess, generosity, critical, creative and systematic thinking, skills at technology, sufficiency economy and basic knowledge of life.
2. Education, be it primary, secondary or tertiary, should be internationally standardized and congruent with the contemporary pedagogical system.

3. Education, both formal and informal, should be developed and promoted for more people of all genders and ages to gain easier access to it.

4. Teachers should be trained and equipped with 21st century skills and upgraded to those of the ASEAN or international levels.

5. Thai youths should be given opportunities to take part in such skill-promoting activities as learning and innovation, information and communication technologies, as well as life and vocations.

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Anxiety among Undergraduate Students in the English Communication Course

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Abstract

This research was conducted to investigate anxiety among undergraduate students in terms of level and causes of anxiety including to propose guidelines for the reduction of anxiety. The samples consisted of 251 Khon Kaen University undergraduate students who enrolled in the English for Communication Course in the second semester of Academic Year 2016. The Multistage Sampling was used to draw the samples. Mixed method design, quantitative and qualitative approaches, was used for data collection and analysis. The questionnaire adapted from the Foreign Language Classroom Anxiety Scale (FLCAS) developed by Horwitz, Horwitz, and Cope (1986) was employed to collect quantitative data regarding level and causes of anxiety. Descriptive statistics used to analyze quantitative data were frequency, percentage, mean, and standard deviation. As for qualitative approach, semi-structured interview form was employed to collect data in order to propose the guidelines. The findings of this research revealed that most students had high level of anxiety ($\overline{x}$ = 3.64, S.D. = 0.955). The highest level of anxiety was found in the element of communication apprehension at high level ($\overline{x}$ = 3.83, S.D. = 0.881) followed by fear of negative evaluation at high level ($\overline{x}$ = 3.56, S.D. = 0.982) and test anxiety at high level ($\overline{x}$ = 3.53, S.D. = 0.996), respectively. Causes of anxiety were mostly from student factor at high level ($\overline{x}$ = 3.69, S.D. = 0.902) followed by environment factor at moderate level ($\overline{x}$ = 2.97, S.D. = 1.092) and instructor factor at moderate level ($\overline{x}$ = 2.80, S.D. = 1.122), respectively. In addition, the students proposed the guidelines for the reduction of anxiety in three factors: student, instructor, and environment. First, the students proposed that anxiety can be reduced by a positive attitude towards English learning by focusing on preparation for learning and self-directed learning to build their self-confidence. Next, the students placed importance on instructors who are friendly and approachable. Student involvement such as group activities was also mentioned as an approach to reduce the students' anxiety. Finally, sharing knowledge with classmate and encouragement given by parents or guardian were highlighted by the students as environment factors reducing their anxiety.

Keywords: *anxiety, English for Communication Course, foreign language learning*

Introduction

Trends of global change in the 21st century have an effect on social, economy, environment, science, technology, and politics including education in all countries. Particularly, education is determined as present skills and knowledge which has to be sustainably developed for future society (UNESCO, 2011). Therefore, education plays a key role in creating and preparing national youths for the 21st century by changing their attitude from the traditional paradigm to the new flexible, creative, challenging, and complicated one. According to rapid global change, education is also important for human resource

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development in the 21st century in several skills - especially communication and collaboration with other people (Vongtathum, 2015).

Second or foreign language skills are extremely important and should be provided for Thai students to prepare themselves for the 21st century learning (Laohajaratsang, 2014). English, a foreign language widely used in Thailand, is a tool for not only communication, but also education, occupation, understanding culture and humankind's vision, and awareness of cultural diversity and perspective of the world society (Ministry of Education, 2008). However, the weakness of English instruction in Thailand has been revealed by Education First or EF, (2015), an international company specializing in studying abroad and worldwide cultural exchange, that the rank of English proficiency of Thai students is low compared with other countries in the ASEAN Economic Community (AEC). English communication is still a major problem in Thailand because it is not much used daily in communication but particularly used by for a specific purpose. Therefore, the students have low experience of using English which results in low level of English skills and an insufficient motivation to learn and practice English. So, this can lead to English communication barrier that is English communication anxiety (Phanphruk & Mahaphuntong, 2007).

Anxiety is considered as an important factor affecting foreign language learning. MacIntyre (1998), a professor of psychology, has stated that anxiety affects not only the foreign language learning but also the success in group work and career. Encountered by foreign language learners, anxiety leads to unsuccessful learning such as getting low test scores. Moreover, high anxious learners have to spend longer time to learn language compared with low anxious ones because anxiety is regarded as an inhibitor in foreign language learning. Tintabut (1998) has additionally supported that all processes of foreign language learning, e.g., input, understanding, and expression are negatively influenced by anxiety which impedes input or allows learners to neglect to learn new things and defend them to express the language. In particular, learners in the countries where learn English as a second or foreign language still face with language learning anxiety. Tunwattanapong and Zhangsirikul (2014) studying on anxiety of students in learning English have revealed that students feel anxious that they cannot make interlocutor understand what they are speaking as well as cannot speak English grammatically during a conversation, and they cannot communicate in English in what they want to because of the lack of vocabulary. In other words, students lack confidence caused by anxiety, which results in avoidance in English communication and low academic achievement. Nevertheless, to be successful in foreign language learning, anxiety experienced by learners can be reduced.

Previous studies have reported that learners' foreign language skills can be improved by reducing anxiety. The study of Phonhan, Phusawisot, and Praphan (2015) has reported that reduction of anxiety by using theme-base instruction can enhance English writing skill of the students. Similarly, Tangnonthaphat (2011) has presented that English oral presentation ability of undergraduate students can be promoted and improved after using group process learning activities to reduce anxiety. As a result, it is very important to study on anxiety in foreign language learning among learners. In consequence, anxiety among Khon Kaen University undergraduate students who enrolled in the English for Communication Course was studied with the purposes below.

Purposes of the Study

1. To investigate the level of anxiety among Khon Kaen University undergraduate students in the English for Communication Course
2. To examine the causes of anxiety among Khon Kaen University undergraduate students in the English for Communication Course

3. To propose guidelines for the reduction of anxiety among Khon Kaen University undergraduate students in the English for Communication Course

Literature Review

Foreign language anxiety refers to a negative feeling that most likely affects students' success and discourages them in learning a foreign language (Thepwan, 2015). An emotional and physical state of fear, worries, apprehension, frustration, shyness, uneasiness, self-doubt, and tension which stems from learning in a foreign language classroom is properly described the characteristics of foreign language anxiety (Namsang, 2011).

The foreign language anxiety can be measured by Foreign Language Classroom Anxiety Scale (FLCAS) created by Horwitz et al., (1986) based on three elements: 1) Communication apprehension is the characteristic of shyness caused by scare and anxiety when a person must communicate with other people. 2) Test anxiety is the state of a person's fear of failure or weak performance during a test or evaluation. And 3) fear of negative evaluation is fear or apprehension of being evaluated negatively by other people, avoidance of evaluation, and prediction of being evaluated negatively by other people that usually occurs in evaluative situations such as job interview and speaking a foreign language in a classroom.

Student, instructor, and environment factors are regarded as the causes of foreign language anxiety. First, anxiety caused by the student factor derives from learners' erroneous beliefs, unrealistic high standards, poor language abilities, and competitiveness and fear of negative evaluation (Zhang & Zhong, 2012). In addition, Price (1991) has described that anxious students tend to believe that their language proficiency is inferior to other classmates, and they were afraid that others may laugh at them when speaking a foreign language. Second, instructor factor has been described by Jomaa and Jupri (2014) that teachers who are unfriendly and strict in the field of criteria and requirements of assessment and presentation that students need to follow can be a cause of students' anxiety. Third, environment factor is related to both peer pressure and parental expectation. Lack of cooperative or supportive learning in a classroom and overcrowded classroom with too many students have been considered by Miller and Cunningham (2011) as causes of anxiety. Also, learners whose parents set high expectation of learning English that they must communicate effectively in a foreign language with other people can get high anxious in learning (Liao, 1999).

Methodology

Research Design

Mixed method, integration between quantitative and qualitative approaches, was used for collecting and analyzing data.

Sample

The sample consisted of 251 Khon Kaen University undergraduate students who enrolled in the English for Communication Course in the second semester of Academic Year 2016 (from 16 faculties). The Multistage Sampling was used to draw the samples. The students were asked to respond the questionnaire, and one student from each faculty was selected to be a representative for semi-structured interview.

Instrument

The questionnaire was employed to collect quantitative data regarding level of anxiety (adapted from the Foreign Language Classroom Anxiety Scale (FLCAS) developed by Horwitz et al., (1986)) and causes of anxiety.

As for qualitative approach, the semi-structured interview form was employed to collect data in order to propose the guidelines.

Data Analysis

1. Quantitative Data

The Statistic Package for Social (SPSS) was used to analyze quantitative data in three part of the questionnaire as follows:

Part I: Personal Information

The descriptive statistics used to analyze personal information (e.g. gender, year of study, and faculty) of the students who responded the questionnaire consisted of frequency and percentage.

Part II: Level of Anxiety

The descriptive statistics used to analyze the level of anxiety of the students consisted of mean ($\bar{x}$) and standard deviation (S.D.).

Part III: Causes of Anxiety

The descriptive statistics used to analyze the level of anxiety of the students consisted of mean ($\bar{x}$) and standard deviation (S.D.).

The criteria used to interpret level and causes of anxiety are presented in Table 1.

Table 1 Criteria for Interpretation of Level and Causes of Anxiety

Range	Interpretation for Level of Anxiety	Interpretation for Causes of Anxiety
4.21 – 5.00	very high level of anxiety	very high level of anxiety cause
3.41 – 4.20	high level of anxiety	high level of anxiety cause
2.61 – 3.40	moderate level of anxiety	moderate level of anxiety cause
1.81 – 2.60	low level of anxiety	low level of anxiety cause
1.00 – 1.80	very low level of anxiety	very low level of anxiety cause

2. Qualitative Data

The semi-structured interview findings are descriptively analyzed to propose the guidelines for the reduction of anxiety in the English for Communication Course.

Findings

The results of this study are divided into both quantitative and qualitative data. The quantitative data consist of three parts: personal information of the students, level of anxiety, and causes of anxiety. The qualitative data consist of three points of the guidelines for the reduction of anxiety such as student factor, instructor factor, and environment factor.

Quantitative Data

1. Personal Information of the Students

There were 251 students from 16 faculties responding the questionnaire: Science (49 people, 19.5%), Agriculture (48 people, 19.1%), Fine and Applied Arts (39 people, 15.5%), Law (33 people, 13.1%), Humanities and Social Sciences (14 people, 5.6%), College of Local Administration (13 people, 5.2%), Architecture (11 people, 4.4%), Education (11 people, 4.4%), Business Administration and Accountancy (11 people, 4.4%), Technology (8 people, 3.2%), Engineering (7 people, 2.8%), Economics (3 people, 1.2%), Nursing (1 people, 0.4%), Medicine (1 people, 0.4%), Associated Medical Sciences (1 people, 0.4%), and Public Health (1 people, 0.4%). These students were composed of 140 (55.8%) female students and 111 (44.2%) male students from different years of study including 242 (96.4%) first-year students, 7 (2.8%) second-year students, and 2 (0.8%) third-year students.

2. Level of Anxiety

Foreign Language Classroom Anxiety Scale (FLCAS) developed by Horwitz et al., (1986) was adapted to measure the level of anxiety among students under three elements:

communication apprehension, test anxiety, and fear of negative evaluation. The results are presented in the following table:

Table 2 Mean and Standard Deviation of the Level of Anxiety

Foreign Language Anxiety	$\bar{x}$	S.D.	Inter-pretation
Communication Apprehension			
Panic of speaking English without preparation	4.44	0.651	High
Getting nervous while listening to English spoken by teacher without understanding	3.95	0.868	High
Loss of confidence while speaking English in the classroom	3.94	0.777	High
Self-consciousness about speaking English in front of other students	3.93	0.848	High
Feeling uncomfortable around native English speakers	3.70	1.002	High
Getting nervous while speaking English with preparation	3.44	0.929	Moderate
Worry about learning a lot of grammatical rules for speaking English	3.43	1.095	Moderate
Average	**3.83**	**0.881**	**High**
Test Anxiety			
Worry about the consequences of failing English class	4.24	0.874	High
Nervousness of being called on in English class	3.84	0.953	High
Discomfort during English tests	3.81	0.955	High
Feeling more tense and nervous in English class than other classes	3.75	1.023	High
Feeling anxious about English class even it is well prepared	3.71	0.934	High
Getting more confused from hard working for English tests	3.25	1.080	Moderate
Getting nervous of forgetting things that have been previously taught	3.20	0.970	Moderate
Bothering with taking more English classes	3.12	1.131	Moderate
Worry about getting left behind because English class moves so quickly	2.84	1.044	Moderate
Average	**3.53**	**0.996**	**High**
Fear of Negative Evaluation			
Getting nervous when being asked questions by the teacher without preparation in advance	3.76	0.933	High
Thinking that the other students are better at English than	3.75	0.879	High
Worry about making mistakes in English class	3.67	0.915	High
Being afraid that English teacher is ready to correct every mistake	3.31	1.077	Moderate
Being afraid that other students will laugh at when speaking English	3.30	1.108	Moderate
Average	**3.56**	**0.982**	**High**
Overall Average	**3.64**	**0.955**	**High**

According to Table 2, students have high anxiety ($\bar{x}$ = 3.64, S.D. = 0.955), and all three elements show high level of anxiety among students.

Students have the highest anxiety in the element of communication apprehension at high level ($\bar{x}$ = 3.83, S.D. = 0.881). The first three major situations of communication apprehension identified by the students consist of speaking English without preparation, which is at high level of anxiety ($\bar{x}$ = 4.44, S.D. = 0.651), listening to English spoken by teacher without understanding, which is at high level of anxiety ($\bar{x}$ = 3.95, S.D. = 0.868), and loss of confidence while speaking English in the classroom, which is at high level of anxiety ($\bar{x}$ = 3.94, S.D. = 0.777), respectively.

Secondly, fear of negative evaluation is the element of anxiety level experienced by the students at high level ($\bar{x}$ = 3.56, S.D. = 0.982). The first three major situations of fear of negative evaluation identified by the students consist of being asked questions by the teacher without preparation in advance, which is at high level of anxiety ($\bar{x}$ = 3.76, S.D. = 0.933), thinking that the other students are better at English than they are, which is at high level of anxiety ($\bar{x}$ = 3.75, S.D. = 0.879), and worry about making mistakes in English class, which is at high level of anxiety ($\bar{x}$ = 3.67, S.D. = 0.915), respectively.

Test anxiety is the element showing the lowest average of anxiety level at high level ($\bar{x}$ = 3.53, S.D. = 0.996). The first three major situations of test anxiety identified by the students consist of worry about the consequences of failing English class, which is at high level of anxiety ($\bar{x}$ = 4.24, S.D. = 0.874), being called on in English class which is at high level of anxiety ($\bar{x}$ = 3.84, S.D. = 0.953), and discomfort during English tests, which is at high level of anxiety ($\bar{x}$ = 3.81, S.D. = 0.955), respectively.

3. Causes of Anxiety

The causes of anxiety among students in the English for Communication Course were examined covering three factors: student, instructor, and environment. The results are presented in the following tables:

Table 3 Mean and Standard Deviation of Anxiety Caused by Student Factor

Anxiety Caused by Student Factor	$\bar{x}$	S.D.	Inter-pretation
Fear of failing English tests or getting low scores	4.15	0.869	High
Being not well-prepared before class, quizzes, and exams	3.94	0.861	High
A belief of having insufficient English basic knowledge and skills	3.88	0.882	High
Lack of knowledge and understanding about English language used in different situations	3.79	0.842	High
A belief of having lower English proficiency than other students	3.61	0.889	High
A belief that English should be communicated like a native speaker	3.48	0.985	Moderate
A belief that English is too difficult to learn	3.43	0.915	Moderate
Having the characteristics of shyness and social phobia	3.18	0.976	Moderate
Average	**3.68**	**0.902**	**High**

Table 3 shows that anxiety caused by student factor is at high level ($\bar{x}$ = 3.68, S.D. = 0.902). The first three major causes of anxiety identified by the students consist of fear of failing English tests or getting low scores, which is at high level of anxiety ($\bar{x}$ = 4.15, S.D. = 0.869), being not well-prepared before class, quizzes, and exams, which is at high level of anxiety ($\bar{x}$ = 3.94, S.D. = 0.861), and a belief of having insufficient English basic knowledge and skills, which is at high level of anxiety ($\bar{x}$ = 3.88, S.D. = 0.882), respectively.

Table 4 Mean and Standard Deviation of Anxiety Caused by Instructor Factor

Anxiety Caused by Instructor Factor	$\bar{x}$	**S.D.**	**Inter-pretation**
Examination questions are not related to what students have previously learned	3.16	1.155	Moderate
The way a teacher speak English is confusing and difficult to understand	2.90	1.141	Moderate
Strictness of grammatically correct communication in English	2.86	1.066	Moderate
Blaming and using unfriendly tone of voice while giving students feedback and advice	2.69	1.117	Moderate
Guidelines for taking tests are not informed to students	2.69	1.189	Moderate
Unfriendliness and unapproachability	2.66	1.103	Moderate
Putting too much emphasis on lecture method	2.64	1.081	Moderate
Average	**2.8**	**1.122**	**Moderate**

From Table 4, the result reveals that anxiety caused by instructor factor is at moderate level ($\bar{x}$ = 2.8, S.D. = 1.122). The first three major causes of anxiety identified by the students consist of examination questions are not related to what students have previously learned, which is at moderate level of anxiety ($\bar{x}$ = 3.16, S.D. = 1.155), the way a teacher speak English is confusing and difficult to understand, which is at moderate level of anxiety ($\bar{x}$ = 2.90, S.D. = 1.141), and strictness of grammatically correct communication in English, which is at moderate level of anxiety ($\bar{x}$ = 2.86, S.D. = 1.066), respectively.

Table 5 Mean and Standard Deviation of Anxiety Caused by Environment Factor

Anxiety Caused by Environment Factor	$\bar{x}$	**S.D.**	**Inter-pretation**
Feeling shy of being the center of attention while expressing an opinion in English among too many classmates	3.26	1.012	Moderate
Parents or guardian's high expectation that students can communicate effectively in English	3.08	1.167	Moderate
Individual assignments provided more than group assignments	2.91	1.135	Moderate
Being nitpicked about using English by other classmates	2.86	1.105	Moderate
Lack of cooperation among classmates in group activities	2.74	1.040	Moderate
Average	**2.97**	**1.092**	**Moderate**

Anxiety caused by environment factor, as shown in Table 5, is at moderate level ($\bar{x}$ = 2.97, S.D. = 1.092). The first three major causes of anxiety identified by the students consist of feeling shy of being the center of attention while expressing an opinion in English among too many classmates, which is at moderate level of anxiety ($\bar{x}$ = 3.26, S.D. = 1.012), parents or guardian's high expectation that students can communicate effectively in English, which is

at moderate level of anxiety ($\overline{x}$ = 3.08, S.D. = 1.167), and individual assignments provided more than group assignments, which is at moderate level of anxiety ($\overline{x}$ = 2.91, S.D. = 1.135), respectively.

The analysis of causes of anxiety can be concluded that student factor causes students' anxiety most, followed by environment factor and instructor factor.

Qualitative Data

The guidelines for the reduction of anxiety proposed by the students comprise three factors: student, instructor, and environment.

1. Student Factor Reducing Anxiety

The students have mostly believed that a positive attitude towards English learning is very important. Pleasure of learning English by opening mind is the first step to improve students' English proficiency including their self-confidence as stated by a student:

"If we love English, our English will be better. We will be confident to speak English in front of the class and to answer a question asked by a teacher."

(A student, Faculty of Engineering, Interview, 3rd April 2017)

English is thought by so many students that it is very difficult for them to learn, so they are not confident and feel anxious to communicate in English. However, preparation for learning and self-directed learning can lead better understanding in learning. Therefore, it makes students feel confident that English is not too difficult, and they can overcome fear of English if they become more self-confident and ready to learn as stated by students below:

"Previously, I did not like English, but when I started to be mindful of it, I felt it is not too difficult to understand. Now, I can easily understand what the teacher teaches."

(A student, Faculty of Technology, Interview, 5th April 2017)

"If I have class tomorrow, I will study in advance to be ready and have sufficient knowledge for answering when the teacher asks a question."

(A student, Faculty of Education, Interview, 5th April 2017)

2. Instructor Factor Reducing Anxiety

The students are mostly pleased with friendly and approachable teacher. The students have thought that teacher should be funny and try to create a lively and interesting leaning environment by sharing a laugh or a smile with students while teaching such as telling a funny story as stated by students:

"I think that the classroom should be full of fun in order that students can feel relax. Students will be interested in learning if teacher make them laugh."

(A student, College of Local Administration, Interview, 4th April 2017)

"Funny teacher together with inserting some jokes during teaching can make learning environment interesting."

(A student, Faculty of Fine and Applied Arts, Interview, 3rd April 2017)

Student involvement was also mentioned as an approach to reduce the students' anxiety. For example, group activities can give them a chance to share their knowledge as well as enhance their language performance especially in speaking in front of the class as stated by a student:

"Group activities can make us not too stressful because we can help each other. For example, individual presentation can bring more pressure and fear than group presentation."

(A student, Faculty of Engineering, Interview, 3rd April 2017)

3. Environment Factor Reducing Anxiety

Classmates and parents or guardian are considered as a factor reducing students' anxiety. The students have stated that classmates or peers can sometimes help them understand more about what they have recently learned by sharing knowledge among themselves with easy-to-understand language as stated by students:

"My friends can help me a lot, or I can ask friends for help in explaining what I get confused with the lesson. My friends can give me better understanding with teenage language style."

(A student, Faculty of Architecture, Interview, 5th April 2017)

Encouragement given by parents or guardian is like as a driving force for students to try harder in learning as stated by a student:

"Encourage from my parents can drive me to keep on trying"

(A student, Faculty of Economics, Interview, 5th April 2017)

Discussion

Students at undergraduate level face high anxiety although they rather have more experience of using English. University-level learning is different from high-school level because students are treated as adults and learn with more diverse people. Classroom embarrassment suggested by Ellis (1997) that when the students become older and get into higher level of education, particularly in a university, they possibly face high social anxiety by avoiding incorrectness of foreign language communication. As a result, students at university level normally encounter second or foreign language learning problem. There are several studies trying to investigate the level of anxiety among the higher education students in different educational institutions. For example, Srisang (2011) have demonstrated moderate level of anxiety found in English major students at a university in Thailand. Similarly, Alsowat (2016) has also stated moderate level of anxiety found among Saudi students majoring in English.

Anxiety, as above-mentioned, commonly happens to the students. In the English for Communication Course, students mostly seem to be anxious with the situation of communication called communication apprehension. According to Horwitz et al., (1986), the communication apprehension is shyness or anxiety about communication with other people leading to the loss of self-confidence of being both message sender and receiver. The current study has found that the students get high anxious in both speaking and listening, i.e., speaking English without preparation and listening without understanding to English spoken by a teacher. This is consistent with the study of Agudo (2013) clarifying that low self-confidence of students occurs when they do not prepare well for English speaking.

Fear of failure tends to be the major cause of students' anxiety. Conroy, Metzler, and Hofer (2003) have defined that fear of failure is negative self-evaluation of learners to be possibly unsuccessful in performance. Jomaa and Jupri (2014) have additionally proposed that fear of failure is an internal factor of anxiety caused by learners worrying about getting low test scores or failing a test as well as being afraid that the performance consequences do not meet their expectation. In the current study, the students are actually likely to fear failing English tests or getting low scores. This is consistent with the study of Aydin (2013)

revealing the anxiety of learning English among Turkish primary students mainly caused by fear of failure.

Although there are numerous causes of anxiety, the students have proposed the possible guidelines for the reduction of anxiety. Student, instructor, and environment combination can help students reduce their anxiety. Students themselves should be well-prepared to create self-confidence and readiness for learning and tests. Instructor should get along with students as well as serve as a facilitator by providing group activities for them to avoid being in the public eye while performing the activities. Supports given by friends and family are important for students to overcome anxiety. Littlewood (1984) has suggested that it needs to reduce students' anxiety in order not to cause the failure of foreign language learning.

Recommendations

This study recommends that the results can be beneficial to all concerned to be used as the guidelines for improving the academic achievement of students. Furthermore, apart from English, it can be possible to study either in other foreign language classes or other courses, such as mathematics, science, social studies, etc.

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Strategies to Deal with Academic Underperformance of Grade 12 Learners in the Free State, South Africa

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Abstract

The grade 12 National Senior Certificate results have been of poor quality over the years in the Free State province, South Africa. This prompted the provincial educational leadership to develop and implement various academic performance improvement strategies. To investigate the strategies that were adopted to deal with academic learner underperformance, the researchers used a quantitative research design. From the 96 underperforming schools in the Free State, a sample of 18 schools were selected by means of a systematic sampling method. This was done by selecting every fifth school from a list of 96 underperforming schools. The sample constituted 18.75% of the underperforming schools in the province. 198 Grade 12 teachers of the selected underperforming schools completed the questionnaire. Due to the exploratory nature of this research, no hypothesis was formulated. The primary aim of the research was to investigate teachers' perceptions of the strategies dealing with academic underperformance of grade 12 learners. Data gleaned from the underperforming schools was quantified and responses were displayed in the five point Likert scale. The findings suggested that although most teachers claimed that subject advisors were not involved in the teaching of their subjects when extra classes were offered at camps and learning centres, the classes were useful for improving academic learner performance. Teachers also claimed that even though they received examiners and moderators reports, they did not use them when they set formal and informal assessment tasks; they used the reports only when preparing learners for their final examination. The authors recommend that careful diagnoses of the causes of academic underperformance must be done before initiating the turnaround strategies. The subject advisors must also determine whether the reasons for poor performance relate to poor content knowledge, inadequate teaching methods or even poor quality of assessment tasks.

Keywords: *curriculum and instruction, intervention strategies, learner underperformance, quality academic results, underperforming schools*

Background

Schools underperform when the average performance falls below the acceptable standard of achievement as prescribed by the Department of Basic Education (DBE) both at provincial and national levels. In the Free State province, schools are said to underperform when they obtain an overall pass rate of less than 60% in the National Senior Certificate examinations. Although it has not been clearly spelt out in the provincial strategy on learner attainment, the bachelor's pass rate of less than 40% depicts results of poor quality. The poor quality of the grade 12 results is cause for concern for the Department of Basic Education and the country as a whole. The Free State Department of Education has come up with various intervention strategies in an attempt to improve these academic results. The grade 12 results and the

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quality thereof, remain unimpressive in many schools despite the many intervention strategies used. Poor performance in grade 12 indicates that there are systemic problems that need to be addressed. Some secondary schools in the province continue to underperform despite the many improvement strategies that are being implemented. The causes of underperformance are well documented yet are not addressed adequately in many of the schools. The fact is, not all schools are successful in identifying key priorities and planning interventions to eradicate underperformance. In secondary schools that have low learner attainment, there are inadequate systems to track the progress of learners and to evaluate the impact of the strategies to deal with poor performance. These schools attempt to improve just too many things at a time resulting in little progress being made.

The fundamental purpose of this study is to investigate teachers' perceptions of the strategies dealing with academic underperformance of grade 12 learners. There have been many intervention strategies over time that are aimed at improving learner academic performance. The results are however not commensurate with the strategies that had been implemented. The Free State Department of Education came up with a document called Provincial Strategy on Learner Attainment (PSLA) that spells out the strategies that are used in the province to attempt to improve grade 12 results. The primary responsibility of the districts is to effectively implement the strategies in all the underperforming schools. The following strategies are implemented:

The role of subject advisors in the teaching and learning process
The current crop of subject advisors are required to be exemplary and to teach learners especially during camps and in the underperforming schools. As specialists in their respective subjects, they are expected to lead the way by providing guidance to the teachers and learners alike. They are considered to be highly knowledgeable and skilled in their areas of specialisation.

The impact of extra classes (camps/learning centres) on learner performance
The grade 12 learners from underperforming schools are taken to camps during the school holidays in April, July and September. The camps would overlap into the October month in some schools. The districts normally appoint competent teachers from other schools to offer tuition in the grade 12 subjects which had many failures at the camps.

Strategies to assist progressed learners
Progressed learners are multiple repeaters who did not meet the promotion requirements of the previous grade and were only allowed to progress on the basis of the number of years in the phase. The learner may only fail once between grade 10 and 11.This implies that some progressed learners had either failed grade 10 or 11. Schools are expected to develop differentiated teaching and learning styles which are suitable for progressed learners. They are also expected to adapt teaching and learning content in order to accommodate the progressed learners.

The use of diagnostic reports in improving the quality of assessment
The diagnostic report contains the qualitative analysis of the subject performance based on the analysis of the learners' responses from the national senior certificate examination answer scripts. The use of the diagnostic reports provides the subject teachers with extracts of the subject that should constitute the focus for interventions in the following academic year. Teachers were expected to pay more attention on teaching aspects of their work which posed problems for the learners.

The impact of curriculum coverage on learner attainment

Curriculum coverage is an integrated tracking tool for the school management team. It focuses on planned activities; activities that have been completed; lists of topics not yet completed and the planned interventions. The aim is to ensure that teachers teach all the prescribed work each academic year.

There are some schools which continue to produce poor academic results in the face of these intervention programmes by the Free State Department of Education at both district and provincial levels. Some schools produce high overall percentage pass rates in one year only to drop drastically in the following years. Other schools have been trapped in the underperformance bracket for three to five years. The quality of passes remains low even in schools that present high overall pass rates. The table below shows the performance of the 18 identified schools in the Free State province.

Table 1: Pass rates in underperforming schools in the Free State since 2009 expressed as a percentage (%) scores

	PASS RATE					
List of Schools	**2014**	**2013**	**2012**	**2011**	**2010**	**2009**
School A	58,9	88,9	68,0	47,5	55,2	70,7
School B	70,0	75,7	66,0	58,3	64,2	52,7
School C	84,7	93,2	60,8	59,2	49,2	45,3
School D	36,4	80,8	56,7	48,8	36,3	63,1
School E	69,6	75,4	63,1	62,6	51,5	47,5
School F	56,3	58,2	55,1	55,8	61,7	78,2
School G	64,8	79,8	49,5	58,7	56,5	54,9
School H	97,4	90,3	38,0	51,0	49,4	41,3
School I	80,0	95,7	59,2	17,06	42,2	49,3
School J	66,7	81,1	53,5	60,0	45,0	48,1
School K	100,0	77,8	47,0	30,7	57,1	50,0
School L	75,3	89,5	59,5	47,8	38,8	50,9
School M	67,1	66,4	65,2	77,8	50,4	56,6
School N	41,0	81,0	41,2	73,4	66,6	63,1
School O	62,1	59,6	65.6	42,9	52,4	70,2
School P	48,5	81,9	45,1	33,3	83,8	51,3
School Q	43,2	81,7	66,9	34,6	50,0	47,1

School R	58,0	71,7	37,2	68,1	69,0	34,4

(DBE 2014:10).

Analysis of Table 1 reveals that the pass rates in the identified schools have been fluctuating over the past six years. Schools B, C, D, E and F have presented less than 40 learners in grade 12 between 2009 and 2014. These schools failed to sustain improved levels of performance in that period. It is evident that there are challenges worth investigating if schools with only a few learners in grade 12 are unable to produce quality results. Schools D, N, P and Q had performed well in other years and proceeded to drop the results drastically in the years following. The analyses of the grade 12 results have shown that performance is linked, among others, to the number of learners enrolled in a school in a particular year. Some schools battle and drop results when they experience an increase in the number of learners in grade 12.

The bachelors' pass rate also gives an indication of the quality of passes. This is the traditional university entrance requirement or exemption pass. Only learners with bachelors pass are allowed to further their studies at the universities. The statistics given in Table 2 below clearly show that the quality of passes across the districts is poor.

Table 2: The bachelors' pass rate in the Free State over the last five years.

Year	Total number of learners who wrote	% Bachelors
2010	27 586	21.4
2011	25 932	26.3
2012	24 265	28.6
2013	27 105	33.1
2014	26 440	30.2

(DBE 2015:05).

The bachelors' pass rate is given against the total number of learners who actually wrote the examination in those years (DBE 2015:05). The quality of the results dropped by 2.9% between 2014 and 2013. Of all the learners who wrote the grade 12 examination, the highest percentage that ever qualified to study at the university is 33.1%. In 2014 this figure dropped to 30.2%. The improvement would happen due to the intervention strategies introduced by the Free State Department of Education. The results would drop with the suspension or withdrawal of the intervention strategies.

Literature Review

Leithwood, Harris and Strauss (2010) argue that many strategies that are aimed at raising the performance have in fact, served to disadvantage the schools further, largely by failing to take into account the context and by locating the blame for failure squarely within the school. Malone (2013) corroborates this view by asserting that in too many instances the strategies and interventions designed to improve the results, fail to make any real sustainable difference to learners and the learning outcomes. The authors further posit that many of the well-meaning interventions and initiatives are disconnected from the classroom where change matters most.

Murphy and Meyers (2008) maintain that the causes of underperformance are many and include poor teacher quality; poor classroom instruction; inadequate teacher knowledge and skills; limited teacher experience; teachers assigned to teach subjects for which they are not trained; high teacher turnover; low teacher morale; ineffective leadership and inadequate resources. These are the most common causes of underperformance in schools countrywide. Poor teacher quality results in poor classroom instruction. This affects the quality of assessment and therefore the learning outcomes. It is very difficult for learners to respond to questions of high order that require higher cognitive level if the quality of internal assessment task is of a low standard. The same holds for teachers who are made to teach subjects for which they never received any formal training. Learners may be subjected to a curriculum that has a relatively low level of cognitive demand that places excessive focus on lower level skills. Such curriculums would not necessarily be aligned with instruction and assessment. Darling–Hammond (2006) affirms that poorly prepared teachers are unable to plan the curricular that meets learners' needs, are less able to implement a range of teaching strategies – especially those that support high order learning and are less likely to know what to do when learners are experiencing difficulties.

The technical report released by the Department of Basic Education after the 2010 national senior certificate examinations revealed that:

- Assessment tasks in most cases were based on past question papers which indicated a lack of confidence in setting their own tasks;
- The assessment tasks set by the teachers focused mainly on recall and did not address higher cognitive levels;
- Moderation at school and district level was evident but lacked the insight and feedback necessary for the implementation of school based assessment; and
- There were no detailed moderation instruments at both the schools and the district level leading to teachers not being provided with constructive feedback (DBE 2011:37).

Leithwood (2010) argues that teachers in the underperforming schools are poorly qualified and poorly prepared or inexperienced. These teachers have low expectations for learner attainment. In many instances they use the traditional instructional methods that are not well suited or appropriately adapted to the purpose of the current curriculum or the needs of the current learners. Lack of instructional leadership contributes to an increase in the number of underperforming schools (Bush 2003). This notion is fully supported by Bottery (2004) who contends that a lot of ground is lost if a decrease in numbers of highly effective, satisfied principals is considered. Horng and Loeb (2010) affirm that schools that improve learner attainment are more likely to have principals who are strong organisational managers than schools with principals who spend more of their time observing classrooms or directly coaching teachers. Effective schools require well selected individuals as principals together with management teams that understand and fulfil their roles as leaders of the curriculum, ensuring that an organised environment conducive to learning is present (Van der Berg, Taylor, Gustafsson, Spaull & Armstrong 2011). However Perumal (2011) notes that inadequate support from management teams at the school, peers, subject advisors, parents and the community often result in low teacher morale. Lack of incentives for teachers also plays a part in teacher apathy. The problem is further compounded by lack of professional development programmes for the teachers. Teacher apathy leads to an inefficient use of time which is the most prominent feature of many South African schools, occurring at three levels: getting to school, getting to class and covering the curriculum efficiently when in class (Taylor 2011). Allington and Cunningham (2007) observe that there are several routine activities that encroach heavily on teaching and learning time. These include but are not limited to snack time, bathroom usage, safety patrol, testing, holiday festivities, birthday

celebrations, making announcements, taking attendance and a host of others. In many instances the six and a half or seven hours in a school day offers only four hours of academic instructional time. Marishane and Botha (2011) concur that when teachers are physically taken away from their classrooms or when their attention is diverted from the instructional programme; the teacher–learner interaction disintegrates, detracting from learner performance. They argue that the subsequent attempts at remedial "operation catch ups" seldom help to mend the broken relationships. The external and the internal interferences are so disruptive that teachers are forced to play catch up throughout the academic year. Mji and Makgato (2006) maintain that internal factors such as outdated teaching practices and lack of basic content knowledge have resulted in poor teaching standards. All these poor practices result in learning outcomes of unsatisfactory quality. Causes of underperformance are many and serious to the extent that no quality learning outcomes can be expected without first dealing with them. It is the researchers' considered opinion that accurate diagnosis of the reasons and causes of underperformance are the fundamental starting points for constructing potentially useful and effective interventions. A lot of research on the causes of underperformance and inefficient intervention strategies pointed to inadequate curriculum coverage (DBE 2013). There is a widespread view that the phenomenal increase in the number of progressed learners in grade 12, lack of innovative handling of increased learner numbers and the change of subjects in the year in which the learner is doing grade 12 also have a negative impact on the quality of the National Senior Certificate results.

Research Design

This research is premised on the positivist paradigm that uses the quantitative research approach. The primary aim of the research was to investigate teachers' perceptions of the strategies dealing with academic underperformance of grade 12 learners. Data gleaned from the underperforming schools was quantified and the responses were displayed in the five point Likert scale. The questions in the questionnaire used in the study were structured in such a way that they shed light on the strategies used to improve learner performance. They also sought to determine if the strategies were indeed implemented and whether they were known to the grade 12 teachers in the schools. Before the questionnaire was finalised, it was pre-tested with ten (10) grade 12 subject teachers who were not part of the research sample. The questionnaire was found to be clear to the respondents and was therefore left unchanged. The population consisted of all the underperforming schools in the province from which a sample of 18 underperforming schools were randomly selected. The questionnaires were administered in the eighteen (18) underperforming secondary schools across five education districts in the Free State. A total of 225 questionnaires were distributed to all the schools under investigation and 198 questionnaires were returned. The respondents remained anonymous and the collected data was not linked to the participating schools. Permission to use the schools was sought from the Free State Department of Education and participation by the teachers was voluntary.

Findings and Analysis

Table 3 below shows teacher responses on the strategies that were implemented in the Free State secondary schools

Table 3 Teacher responses on the strategies that were implemented in the Free State secondary schools expressed as percentage scores (N= 198)

	Questionnaire items on the strategies that are implemented in the Free State to improve Grade 12 learner performance	Agree strongly	Agree	Undecided	Disagree	Disagree strongly
1.	Subject advisors introduce current trends in the teaching methodologies and learning styles.	14.2	38.6	15.7	20.3	11.2
2.	Subject advisors help with the teaching of learners as a way of showing you how to do it.	10.7	31.0	10.7	32.7	15.7
3.	The academic results improve when the subject advisors teach in the school.	6.6	16.0	36.0	26.9	14.0
4.	Subject advisors are highly skilled and knowledgeable in their subjects	16.2	38.4	22.2	16.2	7.0
5.	Your grade 12 learners receive tuition during the school holidays.	52.5	42.4	2.1	1.5	1.5
6.	Your grade 12 learners also attend the matric camps.	47.7	37.6	2.6	9.6	2.5
7.	At the camps the previous grade 12 final examination papers are revised.	28.6	32.6	28.1	8.7	2.0
8.	Matric camps are useful in improving the grade 12 results	26.9	38.6	23.4	8.1	3.0
9.	Your school is not disturbed when teachers leave with grade 12 learners to the camp.	10.6	20.7	18.4	41.2	9.1
10.	Your school has progressed learners in the grade 12 class.	57.4	40.6	0.5	0.5	1.0
11.	Your school has specific intervention programmes to assist the progressed learners.	14.3	43.9	13.3	22.4	6.1
12.	Your school receives grade 12 examiners and moderators reports.	30.3	53.0	6.6	10.1	0
13.	You complete the syllabus in your subjects every year.	33.5	43.7	6.6	15.2	1.0
14.	You teach all the topics in your subject every year.	36.4	41.4	6.6	15.1	0.5
15.	There are still sections of the curriculum of the subjects you teach that you find difficult to teach.	9.6	41.1	4.6	32.0	12.7
16.	There are those sections of the	2.5	13.2	6.7	54.8	22.8

	subject that you do not teach.					
17.	You still fall behind with the teaching of the sections of the curriculum of your subject.	4.1	30.4	9.6	37.1	18.8

It is demonstrated in the table that 48.4% of the respondents disagreed or strongly disagreed that subject advisors were involved with the teaching of the learners and 41.7% agreed that they did teach learners and therefore showed the teachers the most appropriate ways of teaching. This implies that the subject advisors were not really directly involved in the actual teaching of the learners in many schools. It further implies that they were not showing the teachers the teaching and learning styles required to improve their results. The majority (40.9%) of the respondents disagreed or strongly disagreed that the results improved when subject advisors taught in the schools. Only 22.6% agreed that the results did improve when subject advisors were involved in their schools. The majority of the respondents affirmed that the results did not improve as a result of subject advisors teaching in the schools.

The majority of the respondents (65.5%) agreed that matric camps were useful in improving the grade 12 results and only 11.1% did not agree that they were useful. This suggests that the matric camps are, to a large extent useful in improving the grade 12 results. These results show that 31.3% of the respondents agreed that schools were not disturbed when the teachers left for camps and 50.3% of the respondents confirmed that indeed the schools were disrupted when teachers left for the camps. This confirms that schools are indeed disrupted when teachers leave for matric camps. The majority of the respondents (98%) agreed that there were progressed learners in grade 12 in their schools and 1.5% did not agree. It implies that almost all the sample schools have progressed learners in their grade 12 classes.

The majority of the respondents (58.2%) agreed that the schools had specific intervention programmes to assist the progressed learners while 28.5% did not agree. The majority of schools therefore have specific intervention programmes to assist progressed learners. The majority of the respondents (83.3%) agreed to having received the examiners' and moderators' reports. Only 10.1% claimed not to have received the reports. This implies that the examiners' and moderators' reports are available in the majority of the sample schools.
The above table shows that 77.2% of the respondents agreed that they completed the syllabus in their subjects every year while 16.2% disagreed. This implies that there was a noticeable percentage of teachers in the sample schools who did not complete the syllabus in their subjects every year.

The above table shows that 77.8% of the respondents agreed that they taught all the topics in their subjects every year while 15.6% did not agree. This implies that there was a significant number of teachers in the sample school who did not teach all the prescribed topics in their subjects every year. The above table shows that 50.7% of the respondents confirmed that there were sections of the curriculum in their subjects that they found difficult to teach while 44.7% said that they did not find any section of the curriculum difficult to teach. This implies that half of the teachers in the sample schools find certain sections of the curriculum difficult to teach. Of the respondents, 15.7% agreed that there were those sections of the subject that they did not teach and 77.6% disagreed with the statement. This implies that there are teachers in the sample schools who did not teach certain sections of their subjects. It is possible that these teachers did not make an effort to know the sections that they did not teach. The above table shows that 34.5% of the respondents agreed that they fell behind with the teaching of certain sections of the curriculum in their subjects and 55.9% disagreed that

they fell behind. This implies that quite a large number of teachers in the sample schools still fell behind with the teaching of certain sections of the curriculum in their subjects.

There are many causes of underperformance and those specific to each school must first be carefully diagnosed before initiating the turnaround strategies. It is evident that many schools fail to identify key areas that need immediate attention. This derails the effective planning for the interventions that would eradicate underperformance. Underperforming schools try hard to improve too many areas at once. This results in little progress being made. The majority of the respondents stated that the subject advisors are not involved in teaching and learning and thus do not focus on the subject content problems that teachers encounter in their daily teaching experience. Although the subject advisors are highly skilled and knowledgeable in their subjects they cannot be directly linked to the teaching and learning process and they do not get maximally involved in the actual teaching of the learners. The majority of subject teachers also disagree that the academic results improve when subject advisors teach learners in their schools. Subject advisors do not teach in the majority of schools. It is unreasonable to expect teaching from subject advisors to improve results because they are only able to teach for few days. The majority of the respondents agreed that the camps and the learning centres are useful strategies for improving the academic results and hence learner performance. A large majority of the respondents confirmed that schools are disrupted when teachers attend matric camps. This is because matric teachers teach other classes as well which are left unattended when they attend the camps. Thus, attending the camps solves one problem but at the same time it creates another. As a result of these related problems, subject teachers prefer that schools be allowed to arrange their own camps while the districts provide the financial support and monitoring functions. The large majority of the respondents agreed that they have progressed learners in their schools. However, only a small majority of them agreed that they have programmes to assist the progressed learners in their schools. Therefore, it will be difficult to see the impact of the programmes because they are not applied to all progressed learners. While the majority of teachers indicated that their schools have developed the strategies to assist progressed learners, they also confirmed that these learners contribute to the high failure rate in grade 12. This suggests that these strategies may not be effective. The large majority of the schools do receive the examiners' and moderators' reports and use them in preparing learners for the examination. The subject teachers did not, however agree on the use of the reports in setting the assessment tasks and whether the use of the reports leads to improved levels of performance or not. It implies that the School Management Teams are not executing their reporting role as expected. The Heads of Department must moderate the assessment tasks submitted by the teachers. In that way they could determine if the diagnostic reports have been used in the setting of the tasks. They would report to the SMT meeting if that had been the case or not. It can thus be concluded that although the reports are available in the schools it could not be ascertained if they are used as expected or not. The majority of the respondents affirmed that curriculum coverage is a very important strategy that helps to improve the academic results. A large majority of teachers in the sample schools agreed that they complete their syllabuses every year. There are, however, those who agreed that they do not complete the syllabus. The fact that 15.6% of the respondents do not complete their syllabuses is a serious cause for concern because it indicates that many matric learners do not complete the syllabuses of all their subjects. The results prove that curriculum coverage is not followed up positively in the schools. In that way it does not contribute positively to learner attainment. Up to half of the respondents (50.7%) agreed that there are sections of the curriculum of the subjects that they find difficult to teach. This implies that they either do not teach them or do not teach effectively. It may also imply that these teachers are not appropriately qualified in the subjects allocated to them. Therefore the poor matric results

can, amongst others, be blamed on the fact that there are teachers who are not competent to teach the subjects allocated to them.

The following conclusions can be drawn from the findings of this study:
The analysis of the grade 12 results as it appears on Table 1, shows that the strategies did not have a noticeable impact on the improvement of the Bachelor's degree pass rate in the province since they were implemented. Although the strategies might have had a noticeable impact on the overall pass rate since implementation, the improvement was not sustained. It was not a lasting impact because the results kept on fluctuating. The deduction that can be made about this is that the problem of poor performance does not only lie with the grade 12 teachers, but it also lies with the grade 11 learners who are promoted to grade 12 each year. These learners are not competent to complete grade 12. Thus, to have a lasting improvement on the grade 12 results the department of education will have to ensure that there is effective teaching and learning not only in grade 12, but in all the lower grades in both the primary and secondary schools.
The School Management Teams (SMTs) are instrumental in creating a learning environment that enables the learners and teachers to achieve quality learning outcomes. The School Management Teams must therefore take decisive leadership in the implementation of the strategies aimed at improving learner performance. This important management structure in the school must be at the forefront of effective curriculum management and implementation process. This structure must also ensure the effective realisation of the initiatives towards the development of the teachers. There is a dire need for instructional leadership in the schools. The researchers are optimistic that improved and prompt communication between schools and the districts on the relevant strategies, the timing of the implementation and all the related logistics can go a long way in ensuring effective implementation and hence improved learning outcomes. The involvement of the SMTs of the underperforming schools in the planning process is essential for the successful realisation of the intervention strategies. Developing the SMTs would ensure that the internal capacity to sustain improved levels of performance is enhanced.
It is the researchers' considered opinion that the empirical research has provided the schools, the districts and the province with sufficient information that will assist in reviewing and reconstructing some of the intervention strategies. The districts will be in a position to close some of the execution gaps. With the correct implementation and support from the principals, SMTs and subject teachers, the strategies are bound to lead to improved levels of performance. With the positive involvement of the district officials especially the subject advisors and the circuit managers, curriculum management and implementation can be improved. With the positive deployment of the inclusive education officials, care and support for progressed and vulnerable learners can be improved. Effective and meaningful implementation of the strategies to improve learner performance is a collective effort. The gaps observed in the implementation of the strategies call for the immediate revision of the way in which the districts go about in realising the intervention plans. Many of the strategies are implemented without any impact analysis measures. Other strategies are implemented on a very small scale due to a lack of capacity among the teachers while others are imposed on the schools without due regard of the inhibiting factors that may render them obsolete.

Recommendations
Careful diagnoses of the causes of underperformance must be done before initiating the turnaround strategies. A thorough situation analysis must be done before deciding on the most appropriate intervention strategies. The subject advisors must determine whether the

reasons for poor performance relate to poor content knowledge, inadequate teaching methods or even poor quality of assessment tasks. The circuit managers must establish whether the problem emanates from the lack of instructional leadership, low levels of motivation among the teachers; poor classroom management, high rate of absenteeism or ill-disciplined teaching corps that does not respect the notional time. The interventions must then be tailored to address the causes. Monitoring the effective implementation of the improvement strategies is essential. It is not enough to implement the strategies without doing regular impact analysis. It is necessary to find out if the strategy needs to be revised or strengthened for maximum impact. This will eliminate the re- use of the strategies that no longer produce the desired results. Use all the intervention strategies in the school for a period of three years and thereafter allow the school to go on its own but monitor the progress. Schools must improve as the strategies cannot be used forever. All the strategies should be used excluding the use of subject advisors in the actual teaching of learners. Subject advisors should be used to develop and assist the teachers.

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The Analysis of Autism People Post-Special Senior High School on World of Work in Sidoarjo City

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Abstract

The world of work is not only a problem for the graduates of common students. Students with special needs also have the same problem even more complicated in the face of the world of work. One of the causes is the lack of recognition from the community about the competence of students with special needs such as those with autism. One of the most concerned cities in Indonesia with autism is Sidoarjo. The city has 134 inclusive educational institutions which are ready to provide education and quality training for 469 people with autism in this city. However, field observations show that many graduates with autism are returning to their families and burden their lives because they are not accepted for work. So the authors make this study to analyze the work of people with autism post special senior high school in Sidoarjo City. The purpose of this study is to determine where autism graduates in the Sidoarjo City can work independently as well as help the Sidoarjo City government in formulating policies related to Autism. This research is descriptive research type. This research method is done by using survey approach and done manually. Population taken in this research is all post - special senior high school graduates autism student period of 2012-2014. Data collection techniques used in this study include of: (1) observation, (2) interview, (3) documentation, (4) questionnaire method. Based on the research result from number of graduates who have worked as much as 2 people or 50% worked as shopkeepers, 1 person or 25% as a guard house dining, and 1 person or 25% as a builder.

Keywords: *Autism, Special Senior High School, World of Work*

Introduction

Today, awareness about autism in Indonesia is increasingly bigger. One of them is awareness about how to empower people with autism in order to be independent and ready to work. This can be proven from there are many institutions, both private and public sectors, that conduct seminar and socialization about training and empowerment of children with autism such as that conducted by Lembaga Penjamin Simpanan (the institution of underwriter) when commemorating the world autistic day on April 2nd 2014. (bisnis.com, 2014).

This awareness is reasonable because there is an increasing amount of children with autism in Indonesia. According to the Director of Mental Health Development of Ministry of Health, Diah Setia, said that there are ± 112,000 children with autism in Indonesia on range of age ± 5 – 19 years old. This can be assumed that prevalence of autism in Indonesia is 1.68 per 1000 of 15 years old and below children in which total amount of 5-19 years old children is 66,000,805 based on data from Biro Pusat Statistik (Statistics Center) in 2010 (liputan6.com, 2014)

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Sidoarjo is a city in Indonesia known to be most caring to people with autism. This city, also known to be mud of Sidoarjo, even has declared itself to be the regency of inclusive education. Today, Sidoarjo has 134 institutions caring children with inclusion. The institutions consist of 17 play groups, 24 kindergartens, 1 'roudlotul adfal', 65 elementary schools, 25 junior high schools, and 2 senior high schools spreading up to 469 children (infosda.com). People of Sidoarjo and around are expected to be able to access the educational services without discriminations in relation with condition of children so that they earn their rights to obtain the qualified educational services.Meanwhile, obtaining the qualified educational services doesn't guarantee their next education or how they will get a job to fulfill their life independently. Still, most of them go back to their family and become burden of their brother.

Based on UU No. 4 year 1997 about people with disabilities said that "every person with disabilities has a right to get a job and feasible life according to the type and degree of their disability, education, and will". This is without discrimination to people with autism in Indonesia. Therefore, it is necessary to conduct search and research to get data and information in detail about the working world of the extraordinary senior high school graduates in residence of Sidoarjo. Based on the above considerations, the writer wants to study and to know about the working world of the extraordinary senior high school graduates in residence of Sidoarjo year 2012-2014 so that the writer can provide data and information in detail about the working world of the extraordinary senior high school graduates. And finally, the study can give maximum results and the results can be used well for relevant parties

Literature Review

2.1. The Working World

2.1.1. Meaning of the working world

According to Kamus Besar Bahasa Indonesia (Big dictionary of Bahasa Indonesia) in Jiwong (2013) 'world' is the earth with all things on the surface, life nature, all humans on the surface, environment or life field and enhancement among nations. While 'working' is activity conducted by someone to accomplish or to perform something which result in tool to fulfill needs such as goods and services and to get money or salary. So the working world is environment or activity environment of someone to accomplish or to perform something which result in tool to fulfill needs such as goods and services and to get money or salary.

2.2. Autism

2.2.1. meaning of autism

Term of autism first was introduced by Leo Kanner in 1943 although this abnormality has been known since a long ago. Autism comes from word 'auto' means alone. People with autism live as if in their world (Handoyo, 2003). Autism constitutes complex developmental disorder that influence attitude because of lack of communication skill, social and emotional relationship with others, so that they feel uneasy to have skill and knowledge required by them as member of society.

Meanwhile, according to Murtadlo (1998), Autism is the way to think controlled by personal needs to face world based on his/her observation and hope and refuse reality. Below is several autistic behaviors that frequently appear (Amazine. Co, 2013) :

- Repetition of a specific body move
- Resistance to alteration in any pattern

- Overrated attachment to person or object
- Aggressive and repressiveness in both personal and social interaction

2.2.2. Characteristic of people with autism

According to Monks and Rahayu, Siti (2006) below is characteristic of people with autism

1. Disruption in social relation relating to less responsive attitude to social signs that can be used to adjust oneself in specific social context
2. Disruption in communication development both verbal and non-verbal communication
3. Stereotype behavior pattern that can be seen in obsessive behavior, attention scope narrows and focuses to detailed things in environment

2.2.3. amount of people with autism in Indonesia

To date, there is no data to state exactly how many people with autism in Indonesia are due to it has never been surveyed officially. But, according to the Director of Mental Health Development of Ministry of Health, Diah Setia, there are 112,000 children with autism, ranging from 5 – 19 years old, in Indonesia. This is assumed by prevalence of autism that is 1.68 per 1000 children with age of 15 years and below in which there are 66,000,805 children with age of 5 – 19 years based on data from BPS (statistic center) in 2010 (republika.co.id., 2013).

2.3. SMALB (Special Senior High School)

2.3.1. meaning of SMALB

SMALB is a special education unit for children with special needs who can't afford to take lesson in inclusive program or special class in regular school. For them who classified into normal cluster and want to continue to college can register oneself to inclusion program.

2.3.2. curricular of SMALB

Basically structure of curricular of SMALB is similar to regular education, i.e., in core competence formula is using notations as follows:

1. Core competence – 1 (K-1) for spiritual attitude core competence
2. Core competence – 2 (K-2) for social attitude core competence
3. Core competence – 3 (K-3) for knowledge core competence; and
4. Core competence – 4 (K-4) for skill core competence

Method

3.1. Method and Technique of Research

This research uses descriptive quantitative research type. Method of research is conducted by manually using survey approach. Population in this research is all graduates of SMALB in Sidoarjo with 8 sample of SMALB who have graduated their students in period of 2012 – 2014.

3.2. Technique of data collection

Technique of data collection in this research is : observation, interview, and documentation. Observation is conducted by visiting 8 sample of SMALB to collect data of SMALB graduates with autism in period of 2012 – 2014. Interview is conducted by headmasters of 8 sample of SMALB. Meanwhile, technique of documentation is conducted by reading reference relating to topic of the research.

3.3. technique of data analysis

Technique of analysis used in this research is descriptive analysis technique with percentage. Data will be descripted based on interview with headmasters and graduates with autism in 8 sample of SMALB.

Findings/Analysis

4.1. the obtained research

No	Activity	1st month 1				2nd month				3rd Bulan				4th month				5th month				implementation
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	
1	Making instruments	■	■	■																		100%
2.	Making letters				■	■																100%
3	Making technical plan				■	■																100%
4	On field survey						■	■	■	■	■	■										100%
5	Observation and interview												■	■	■	■						100%
6	Presentation of journal																		■	■	■	20%
7	evaluation																■	■	■	■	■	80%
8	Making report																		■	■	■	100%
	Total percentage																					**609 %**
	% achievement of program																					**87 %**

From table above, it can be known that up to date, implementation of planned program reaches 87%. Meanwhile, 13% of program have not been implemented that is preparing final report. Preparing final report will be conducted on date of 16 – 11 June 2015.

Interview is conducted in 8 sample of SMALB that is SMALB Dharma Pendidikan, SMALB Delta Sejahtera, SMALB Dharma Wanita, SMALB Aisyiah Krian, SMALB Al-Chusnaini, SMALB Dharma Wanita Lebo, SMALB Putra Mandiri, and SMALBN Gedangan. There are 14 graduates of SMALB in period of 2012 – 2014 which is listed below:

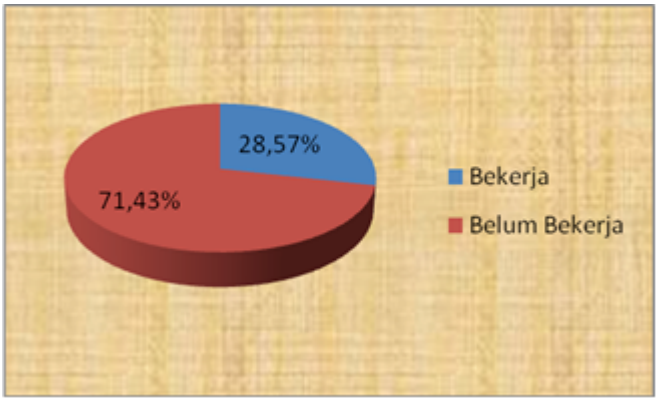
Table 4.2 Amount of SMALB Graduates in Regency of Sidoarjo

No	Name of School	Graduates			Amount
		2012	2013	2014	
1	SMALB Dharmawanita Pendidikan	-	1	1	2
2	SLB Delta Sejahtera	-	-	1	1
3	SMALB DharmaWanita	-	-	2	2
4	SMALB Aisyiah Krian	1	2	1	4
5	SMALB Chusnaini	-	1	-	1
6	SMALB Putra Mandiri	-	-	2	2
7	SMALB Dharmawanita Lebo	-	1	-	1
8	SMALBN Gedangan	-	-	1	1

Amount	14

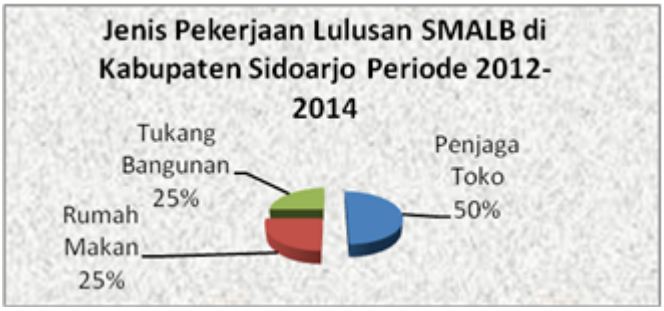
Based on table above, it can be seen that in period of 2012 – 2014, eight sample of SMALB have graduated only 14 students. Based on results of search, 4 of 14 students have had job and the rests have not had job or go back to their parents.

Figure 1.
Comparison between SMALB graduates who have had job and
who have not had job



From graduates who have had job, there are 2 graduates or 50% who working to be shop servant, 1 graduate or 25% who working to be restaurant keeper, and 1 graduate or 25% who working to be workman.

Figure 2.
Type of job owned by SMALB graduates



4.2. Special Potential

1. Theoretical benefit

Theoretical benefit obtained from this research is to contribute to development of science specially in field of education of children with autism and field of social economy

2. Practical benefit

Practical benefit obtained from this research is

a. for the writer. It contributes to the writer's knowledge. Interest of the writer in extra ordinary education increases.
b. for authority of education in Sidoarjo. It is input for giving training and socialization about empowerment of children with autism
c. for all SMALB in Sidoarjo. It guides about method of training or job training so that can prepare the graduates in order to be independent and ready to work

d. for the people. It gives information about how to detect a child with autism in early ages thereby people can anticipate it earlier.

Recommendation

Based on results of research, the writer feels that government of Sidoarjo regency hasn't work maximally to accommodate the graduates of SMALB because they assumed that amount of children with autism is still less than children with other disabilities. In order to maximize graduates of SMALB with autism in work world, government should not underestimate them with the reason of less in amount because amount of people with autism is increasingly high. Government should prepare programs to distribute people with autism into work world so they will not go back to their family after graduating from SMALB

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Interactive Multimedia Scale Media Based Orientation and Mobility to Implant Mastering Concept of School Environment to Blind Students

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Abstract

Developing interactive multimedia scale media based orientation and mobility to implant mastering concept of school environment strived to help solving the blind students' problem so that they could study with comfortable, safe and happy, brave walking autonomously and hope continuously to be success person to do daily activity. In specific, this developing research had purpose to produce the prototype of interactive multimedia scale media based orientation and mobility to implant the mastering concept of school environment to the blind students in Special School. This developing research used Educational Research Development (R&D) model design from Borg & Gall. The prototype product of interactive multimedia scale media based orientation and mobility to implant the mastering concept of school environment to blind students in Special School contained the realization of product arrangement, i.e. 1) the guide of building and road access to various places of school environment with the concept of audio program and Braille writing, 2) the form of multimedia scale media in the direction, 3) operating how to strike the keys suitable with the destination intended and being provided to the scale media of school environment building, and 4) assessment instrument for mastering environment concept with authentic assessment as the success in orientation and mobility. The prototype product of interactive multimedia scale media based orientation and mobility to implant the mastering concept of school environment to blind students produced could be used as the effort of recognizing social environment with comfortable, safe and happy.

Keywords: *Interactive Multimedia Scale Model, Mastering Environment Concept*

Introduction

The effect of blindness shows that her/ his can not get the complete knowledge of the environment. Persons with visual impairment who has a disorder in physiological structure, she/he will change the function of her/his sense of sight to another sense to perceive the environment. In connection to the blind student with the minimum concept in the environment, so that it could give impact toward the ability of orientation and mobilization which owned by each of students and it has the negative influence for her/his surrounding recognition. When the student has a problem in mastering the environment concept, then it will disturb her/his orientation and mobilization automatically. The blind student has a tendency to be a passive person, specifically in body movement. It happens because he/she feels worry about getting an accident or stray when walking around. In a spacious place such as school environment, sometimes he/she feels confuse when walking in a location that rarely accessed even though he/she has good ability in both of orientation and mobilization. This situation showed by the number of activities which done through the society independently. However, the vagueness in recognizing a certain place can make the ability of mobilization and orientation which possessed by the blind student can not help much.

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One of the mobilization and orientation are which known by the blind student is school environment. Visual impairment school is the second environment after home beside family. For 8 hours a day or at approximately 33% of the time was spent by blind students at the school. Moreover, those who live in the hostel, declare that school is regarded as the most important environment in conducting various life activities. On the other hand, a teacher not only takes an utilize of one specific room during teaching and learning activities. A teacher tends to engage the student to move from one class to another one which is appropriate with the lesson during the learning process. The student will be left behind if he/she does not have good comprehension of school environment concept. Therefore, the introduction of the school environment is an essential for the blind student. This matter is an appropriate curriculum for the Orientation and Mobilization development which one of the basic competencies stated that blind student has to be able to walk independently in the outdoor or indoor room.

In introducing the school environment to the blind student the teacher can use a learning method based on environment (learning environment). By utilizing the school environment, the student is directly invited in obtaining the concept and experience understanding which is refered to the essential of an object outside of him/herself. Learning by utilizing a school environment outside of class is an appropriate concept when applied in teaching orientation and mobilization. In connecting with it, many students are trained in performing the orientation of an object or objects which are can be done outside of the class environment. By conducting learning activity outside of class, it can create the independence toward student activity. Mobilization training is also a good method when it is done outside of class. In an outdoor environment, blind student are trained to find landmarks/terrain characteristics and clue or signs that can be used as the direction when walking around.

The finding of field data that is supported by the result in January 2015 interview with several blind students on mastery of concept toward school environment, clarify that blind students are still confused when walking in the school environment that they rarely visited. Blind students are more familiar to the environment around their classroom. Another weakness of blind students a lack of understanding the condition of all the building position and road access that exist around school.

To overcome these problems, there are two ways that should be done by a teacher. The first step is by giving the blind student an orientation and mobilization skills. These skills can be used as a guide for them to perform various activities at school. While the second step is to develop a media that can provide an idea about the school environment. The Development of the multimedia scale model is based on learning technology. To choose an appropriate media for blind students, it is necessary to consider the student's characteristic. Visual impairment is an individual who use more feeling and hearing during the sighting. So that the media which is presented have to be able in optimizing blind student through these two things. Besides, the selected media must be directly controlled by the student and capable to creating an interaction between blind student and an object or other friends. Therefore, interactive multimedia is an appropriate media which is presented for the blind student to install the mastery of school environment concept. Interactive multimedia has been widely used by an educator in order to improve the student achievement. The result of it is very positive. As the research that is conducted by Nandi (2012) on the use of interactive multimedia in geography teaching at schools. The result is the students are to be more motivated to learn geography, so that the learning performance also increased.

Based on the explanation above, in developing the interactive multimedia scale model based on orientation and mobilization to install the mastery of school environment concept in the blind student. Amran, (1997: 106), mentioned that scale model is a form of imitation of

something in a small size. Scale model media provide an impression of a three-dimensional scale model of a real object whether it is life or not. Scale model a multimedia interactive or models are very helpful to communicate the essence of a variety objects, even bigger, wider, too far, and others.

In link with a multimedia scale model, it is designed with an audio program to provide guidance for blind students to get the various places at school environment. Furthermore, this design is completed with Braille letter in each building, so that it ease the blind student to recognize every building when she/he want to get there. The completeness of audio program which heard by the student is the direction to get to the various places that available at school, and this will be recorded and remembered in the student's brain as the knowledge. These knowledge understanding will be confirmed by blind students through their feeling; one of it is use an interactive multimedia scale model that is equipped with Braille letter.

The orientation of an interactive multimedia scale model through palpation, hope that the student can imagine the position of each imitation building at school, so that the scale model that already touched can be said as a concept understanding. The impact of it is he/she can obtain real performance at school environment. This interactive multimedia scale model as an alternative to instill the concept of school environment that can be designed on the environment (outdoor) wider, so that blind students can easily understand the condition of the social environment. The assertion Ungar, Blades, and Spencer (1999), shows that to provide the mastery concepts for blind student, one of them is the use of map and scale model arise in informing the understanding of learning, while the result will be better by setting the environment (outdoor) which is relative stranger for the student.

Based on these conditions, show that blind students have difficulty in mastering the concept of the school environment, so that give an impact of the weak ability in their orientation and mobilization. The spacious and wide environment of school is very difficult to be oriented by blind students overall. The complexity of road access and building orientation perceived the wrong position by blind students, so they often hampered during mobilization and even wrong in heading to a certain place.

These problems occurred because blind students lack imagery/mapping toward school environment. Therefore, the development of interactive multimedia scale model can represent the existence of a school environment that can be observed through blind student tactile. Furthermore, interactive multimedia scale model which is based on the orientation and mobilization as an alternative to instill mastery of concepts about school environment in the blind student. The use of scale model in Indonesia has been widely used as a learning media with a very satisfactory result.

The embodiment result by using scale model media not only about the concrete image of the wider and spacious environment, but it have the potential to motivate and please the spirit of learning for students. Therefore the existence of scale model nowadays requires a development to be an interactive multimedia which is more interesting, and could ease blind student to learn and understand the concept. This insistence can exist by realizing the development of interactive multimedia scale model which is based on orientation and mobilization to install the mastery of school environment concept in the blind student. Based on the explanation, it's come the research problem on how does the development of the result of interactive multimedia scale model based on orientation and mobilization to embed the mastery of school environment of blind students in Special School.

Literature Review

Lowenfeld in Lydy Reidmiller,Lauri (2003), stated that there were three forms of limitation as for the blindness effect : (1) the limitation of concept and experience diversities

(2) the limitation of environment interaction (3) the limitation of orientation and mobilization. It can be said that blind student often encounters the movement limitation in her/his environment. This situation happens because the blind student does not master the good concept toward surrounding. The complex problem of blind students in mastering the concept of low environmental orientation and mobilization within the board school environment, so that complicate to understand the school condition. Besides, the information that obtained by students concerning the school environment is merely verbalises in the form of words from a teacher or other friends. In obtaining the information it could be understood incorrectly by one of the blind students. The basic facts found that blind student was having problems in understanding the board object such as school environment.

To cope with this problem so it is necessary to develop a media that can provide an idea about the school environment. The Development of the multimedia scale model is based on learning technology. Learning technology (instructional technology) in design, development, utilization, management and evaluation of processes and resources for learning (Seels, B. Barbara and Rita C. Richey. 1994). Learning technology strive to design, develop, and utilize a variety of learning resource, so that it ease or facilitate someone to learn in anywhere, anytime, by anyone, and by any learning resources which is appropriate to the condition and need.

According to Heinich, Molenda, Russell and Smaldino (1999: 229) said that multimedia refer to the various combinations of two or more media formats that are integrated into the form of information or program instruction. Interactive multimedia is a multimedia which is equipped with a controller that operated by the user, so the user can choose what they want for the next process. The most important characteristic of an interactive multimedia is the students not only pay attention to media or objects, but also required to interact during learning.

Method

1. The Approach and Type of Research

This study uses *research and development* (R & D) approach as a type of research development from Borg and Gall (1983). This research produces a product of interactive multimedia scale model based on orientation and mobilization to embed the mastery of school environment concept on Special School's blind student. On this research development, SPECIAL SCHOOL's blind student is the subject of the study.

2. Model of Research and Development

This research development uses ASSURE as the model design which is developed by Smaldino, Sharon E & Russell, James D (2005), they confirmed that the product development is not only in the form of learning media, but it can be a procedure, instrument, and learning process. Moreover ASSURE model as the first step of research to produce the product of interactive multimedia scale model based on orientation and mobilization to embed the mastery of school environment concept on Special School's blind student. Deployment and implementation is done when the developed product has fulfilled the eligibility standard and the final product which has good result during testing. In a research procedure of Borg and Gall (1983) can be seen schematically from the table below.

a. Preliminary and collection study of data & information, consist of.
   1) Theoretical study on the development of interactive multimedia scale model based on orientation & mobilization to embed the mastery of school environment concept in Special School's blind student

2) The data and field situation on the development of interactive multimedia scale model based on orientation & mobilization to embed the mastery of school environment concept in Special School's blind student

b. Planning, drafting a development of interactive multimedia scale model based on orientation & mobilization to embed the mastery of school environment concept in Special School's blind student.

c. Text expert for the development of interactive multimedia scale model based on orientation & mobilization to embed the mastery of school environment concept in Special School's blind student. The final result of the development of interactive multimedia scale model based on orientation & mobilization to embed the mastery of school environment concept in Special School's blind student.

Interactive multimedia scale model which is based on orientation and mobilization to embed the mastery of school environment concept on Special School's blind student that have been developed in this study is expected to have a high degree of feasibility. Dealing with that, it is necessary to do a series of validation test of the product and making a revision based on the validation test. Validation test is done through the review of both of blind and media expert. The test subject is done by 1) multimedia experts, 2) information technology experts, and 3) an expert of special education blindness.

The type of data on the development of this form of descriptive qualitative data. Qualitative data in the form of (1) the information field of the learning program orientation and mobility were obtained through interviews with teachers school of dissability and principal, (2) information about the learning program orientation and mobility were obtained through interviews with the students with visual impairment, (3) review of references of articles and books on the development of multimedia interactive mockups based orientation and mobility. Data collection techniques in this study using observation and performance results manufacture of products.

Findings/Analysis

1. Development of the result

In this analysis, the needs of orientation and mobilization learning are focused on the development of its learning curriculum. One of the basic competency stated that blind student has the ability to walk independently in outdoor and indoor. Introducing the school environment to a blind student, a teacher could use a learning method which refers to the environment (*environment learning).* By utilizing the school environment, the student will obtain the important of experience and concept understanding which refer to an object outside of himself. Learning by utilizing an environment outside of class, is an appropriate method if it is applied in mobilization and orientation learning. In learning process, the students are trained to do an orientation for a certain object and it is done by them outside of class. During learning and teaching outside of class, it can help the students to be more independent in doing their activities. Outdoor is the best place to do the mobilization training. In outdoor, the blind student was trained to find landmark or clue that can use as the direction when walking around.

To achieve the goal from the development of interactive multimedia scale model based on orientation and mobility in installing the mastery of school environment concept in blind student, it needs several steps below.

a. Assessment

The development of orientation and mobilisation assessment is a systematic method to know about

1) What has been mastered
2) What hasn't been mastered
3) What is needed

The development material which is already known or yet unknown, but it is not required then the material does not need to be programmed. While the material that has not been mastered yet an unneeded it needs to be programmed to teach the blind student.

b. Establish the priority of training material

Based on the assessment, when there is an indication of the material that has not been mastered is more than one, then a teacher has to choose a certain priority material to be trained.

c. Establish the training purpose

After finishing the material establishment, then a teacher drafting and establish the goal that to is achieved and it must have several elements below.

1) A= Audience means who will reach the goal
2) B = Behavior means performance behavior
3) C = Condition means in what condition the behavior should be presented by the audience
4) D = Degree means as a performance behavior criteria show the successful in mastering skills and knowledge.

The development of the product multimedia scale model which is based on orientation and mobilization have the shape of building and room which is used as a learning activity. Below are the room and area depiction which is used in the school environment as the direction design of orientation and mobilization for the manufacture of an interactive multimedia scale model.

a. Classroom
b. Teacher room
c. Room of head of school
d. Computer laboratory
e. Library
f. Pray room
g. Hall
h. Sport yard
i. Girl's hostel
j. Boy's hostel
k. Restroom/toilette
l. Schoolyard
m. Storehouse
n. House of school keeper

The product of this research is interactive multimedia scale model which is based on orientation and mobilization as the effort of cultivating the mastery of school environment concept toward blind student in Special School as shown in figure 1 until figure 3. This Interactive multimedia scale model which is based on orientation and mobilization are developed to apply benefits toward blind students to acquaint the school environment. The interactive multimedia scale model is made by an audio program which contains the guidance of access to any places inside the school. in comprehending each building on scale model is

by handing with information in the form of *braille,* which is useful as a mediator to give the sight in the environment.

There products of Interactive multimedia scale model which is based on orientation and mobilization to cultivate the mastery of school environment concept toward blind student are in the following:

1. Access guidance of building and path to go to any places around school by the audio program and braille concept.
2. The construction of a multimedia scale model which contains direction guideline.
3. Operation system by pressing the button of place where the students intend to go which exist in the scale model.
4. An evaluating tool as the mastery of environment concept with authentic scoring as the achievement in orientation and mobilization.

The urgity of product development interactive multimedia maket based on the orientation and mobility by special education expert, including :

1. Material depth and mobility need to be concrete with supporting display.
2. The blind students are feeling as a visual aid.
3. Requires an integrated way when blind students change places of learning to avoid or reduce the mistakes of the intended space.
4. For sure blind students dare to travel from one place to another.
5. Setting criteria for foresight and mobility

Similarly, the direction given by educational technology experts to manufacture products based on interactive multimedia mapping orientation and mobility to instill mastery of the concept of school environment, the following.

1. Orientation and mobility learning objectives are more targeted
2. In evaluation to be more qualified to be categorized successfully
3. Direct observation when blind students perform such orientation and mobility activities
4. Learning more directed at the ability of learners to be independent

Then the electrical engineering experts argue that the product of interactive multimedia model maket based on orientation and mobility to instill mastery of the concept of school environment in blind students, that is.

1. The sounds raised on the interactive multimedia mockets when operated must be clear
2. The security level of cable flow from one place to another needs to be revisited
3. Guide book interactive multimedia mockups based on orientation and mobility of language use easy to understand students with visual impairment

Furthermore, civil engineering experts provide exposure to the form of interactive multimedia maket building based on orientation and mobility between one place to another which is directed the existence of concrete in the material directions. Then the alignment of electronic devices with the size of the building of interactive multimedia model requires attention and thoroughness to produce products that have the potential to help the visually impaired and mobility.

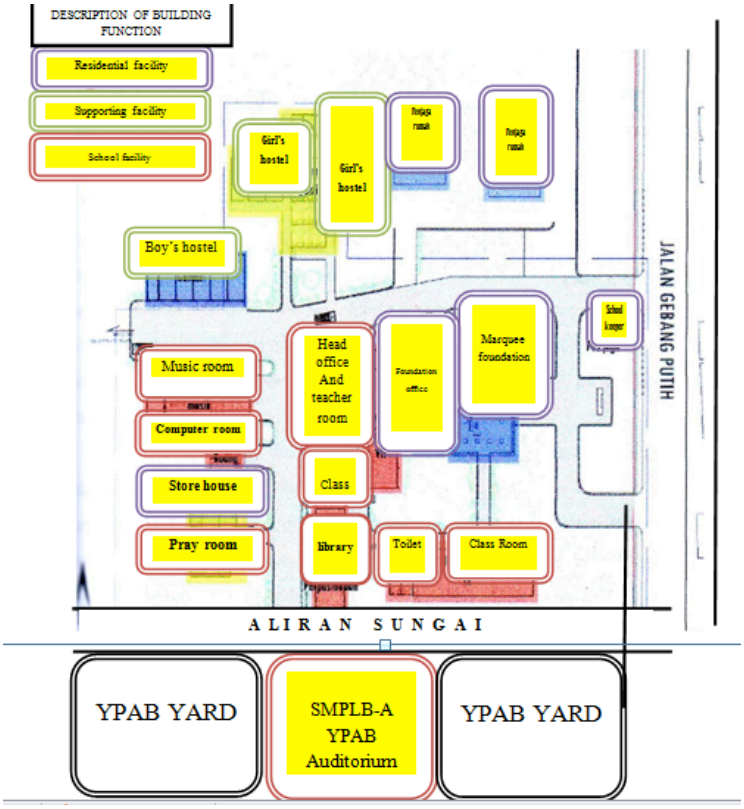

Figure. 1. Landscape scale model

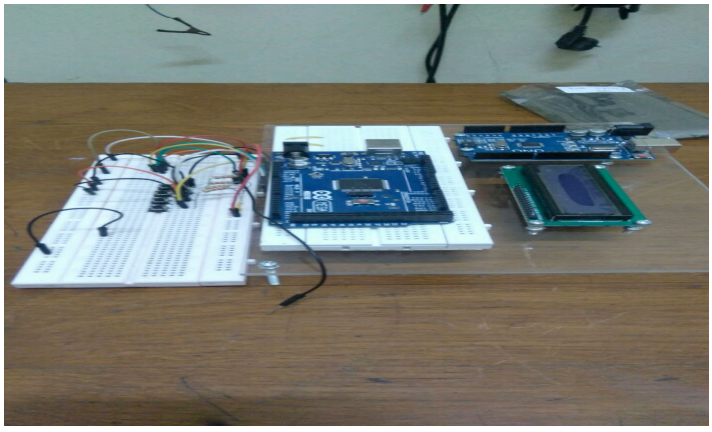

Figure 2. Audio generator electronic circuit was built on that scale model

Figure. 3..Interactive scale model for orientation and mobility

Sudjana and Rifai (2005) argued that scale model is replicates of three dimension of several real objects which have a bigger size, too much further, too much smaller, too much expensive, too much rare, or too much complicated to be shown in class and learned the students from the original object. Based on that view, it can be understood that scale model as learning media three dimensions is replicates of the real object to connect any barriers that may appear, if providing the object directly in the class. In this case, the view of the real object is still can be felt by students without cutting down the real structure, so the learning process can be more meaningful. Scale model concept as replicates of three dimension object which is built to represent the existence of the real object which is too much bigger, smaller, distant, wider, so it can be observed directly by students through their feeling.

While multimedia is emphasized by Nandi (2012), a combination from least two input or output media. The media can be audio (sound, music), animation, video, text, graphic and images. Later on, another definition is asserted by Bonk, Curtis J and Graham, Charles R. (2006), argued that multimedia literally is electronic media to storage and display multimedia data. Based on definitions above, it can be concluded that multimedia is the combination of two media that can be an audio (sound, music), animation, video, text, graphic and images which are used as mediator learning to public.

Interactive multimedia is as one multimedia which is completed by a controlling system which can be operated by users so they can choose what action to be done next. Interactive multimedia combines and synergizes all media which consist of: a) text; b) graphic; c) audio; and d) interactivity (Bonk, Curtis J and Graham, Charles R, 2006). The use of interactive learning multimedia technology is one of learning mediator, has several basic power.

a. Mixed media

   By using multimedia technology, all conventional media which exist can be integrated into one kind of interactive media, such as text media (whiteboard), audio, video, that if being separated will require more media.

b. User control

   Multimedia technology can be used by users to go through learning material, that is suitable with ability and background knowledge.

c. Simulation and visualization

Simulation and visualization are the specific function which exists in interactive multimedia, thus through animation technology, computer simulation and visualization, the users will gain information which is more real than abstract information. At some curriculum is needed complex comprehension, abstract, dynamic process and microscopic, thus by simulating and visualizing, students can developmental model in their cognitive aspect. However, for blind students, simulation function is more emphasized since they can try directly on its use.

d. Different learning model

Interactive multimedia has potential to accommodate users with different learning model. Nandi (2012), said there are six criteria to evaluate interactive multimedia; (1) easy of navigation, (2) cognitive contain, (3) information percentage, (4) media integration, (5) artistic and esthetic and (6) has all function.

Problem complexity of blind students in comprehending environment concept which is too wide makes them difficult to understand school situation. Besides, information which is gained by students about their environment is only verbally that is in the form of spoken by teacher or other friends. The information may be understood in wrong way by students. The basic fact found that students undergo a problem in understanding an object which is too wide such school environment.

In order to overcome the problem, there are two ways to be done by a teacher. The first step, give specific skill orientation and mobilization toward blind students. With skilled orientation and mobilization, it can be used as guidance to do any activities inside the school. the second step, develop learning media which can give a view about school environment toward students. Development of multimedia scale model is wrapped in instructional technology basics. Instructional technology is in design, development, usage, the operation also evaluation about process and source to study (Seels, B. Barbara & Rita C. Richey: 1994). Instructional technology affords to build, develop and use any learning sources thus make it easy or facilitate someone to study anywhere, anytime with any sources of learning which is suitable with condition and necessity.

Lahav, O and Mioduser, D. (2002), argues orientation is the ability to understand the relation between one object with another; the creating from one mental pattern of the environment. Meanwhile, mobilization covers skilled achievement and technique which make people who obtain blindness can mobilize easier in their environment. In mobilization orientation, direction and destination concept are two important things that must be mastered by blind students. By understanding direction and destination concept, thus students are able to mobilize accurately and effectively. Accurately refers to students can afford destination as they will, while effective refers to students are able to go to a place they want to on time.

Concept understanding of direction is very useful to build students' independence in doing orientation and mobilization at school. this concept gives and cultivates comprehension toward students about certain height direction and the way to decide angle which is made by certain direction. The direction is very important to understand by doing direct practice. However, for blind students which belong to child age, left, right, front and back are direction concept which can be taught earlier.

The distant concept also must be understood well. this is important to be learned so that students are able to go to a place they want to. In orientation and mobilization, distant measures commonly use the meter, fathom and footstep. But, to make it easy for students to understand the distant concept, it only needs foot step measurement.

However, other than distant and direction concept, there is one important matter which must be mastered to understand school environment well. it is the mastery of concept

about school environment which is pictured in students mind. In order to cultivate this concept, it is not easy to picture the environment in their mind. Students which undergo blindness since their birth, they are a lack of concept so it is difficult to give some images of certain objects. Furthermore, the objects are only told verbally. The same thing occurs towards students who undergo blindness after they could see, the concept they own is not adequate to support creating cognitive mapping towards an object that is too wide. That is why it needs media with the concrete construction which can be felt and observed by students directly through their hearing and feeling.

Recommendation

Below are conclusions which show developing blind students mastery of environment concept through an interactive scale model which is based on orientation and mobilization to cultivate concept comprehension in the school environment by blind students. Produce interactive multimedia scale model which is based on orientation and mobilization product to cultivate environment mastery comprehension to blind students which consist of a) guideline access of building and path to any places in the school with audio program and braille, b) the construction of interactive multimedia scale model which contains direction, c) operating by pressing the button which is suitable to destination in the scale model and d) evaluation tool to master the school concept by evaluating authentically as the achievement in orientation and mobilization. So it is recommended to give education and training for blind students in Special School to use the products of interactive multimedia scale model which is based on orientation and mobilization for mastering school environment concept.

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Management of Inclusive School's Teachers in Indonesia

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Abstract
Inclusive education in Indonesia has been going on long time. In its development there are still many problems that arise, one of the main problem is teachers management. The aim of this research are to know: (1) What are the problems in implementing the management of inclusive school's teachers in Indonesia ? (2) What are the causes of problems in the implementation of inclusive school's teachers managament in Indonesia ? and (3) How is the recommended inclusive model of inclusive school's teachers management in Indonesia? Research method used is literature study, through stages of : data collecting, data analysis by meta-analysis with qualitative approach, and conclusion drawing. The result of this research are : (1) There are 12 problems in management of inclusive school's teachers in Indonesia, and mainly happen on special education teachers (2) Problems caused by lots of factors include of : lack of knowledge and experience, lack of training program, and government support (3) recommended model for inclusive school's teachers management is school-based management with the following stages : planning, organizing, implementing, and monitoring. As the recommendation principals, teachers, community, and government must be work together by following management process properly.

Keywords: *Inclusive School's Teachers, Management*

Introduction

Indonesia is a country with the high number in people with disabilities, based on World Health Organization (WHO) almost 10 percent of Indonesian people are disabilities (around 24 million) (ILO, 2014). In order to ensure that every people with disabilities in Indonesia get education acces, the Indonesian government already implemented inclusive education as the solution. Although in Strategic Plan of the Indonesia National Ministry of Education in 2005 it was written that education services for people with disabilities in Indonesia can be done through two educational services provided include of: special schools and inclusive schools, but inclusive schools more accentuated in Indonesia instead of special schools because of several reasons, mainly in the aspect of accesibility and economical reason (Garnida, 2015: 57). While service in special schools reserved for people with disabilities whose experienced severe disabilities and require special intervention.

The development of inclusive education in Indonesia has been going on long time. Inclusive education in Indonesia was started in 1960 in the Bandung City, West Java Province, and after that inclusive education in Indonesia was growing into positive trend. Based on data by Indonesia's Directorate of Special Education and Special Services (2013) on Yusuf (2014:1), number of inclusive schools in Indonesia on 2007 is about 925 schools (from elementary school until senior high school) and on 2013 the number of inclusive schools is around 2.100 (also from elementary school until senior high school). Although this condition shown positive response of inclusive education, but unfortunately, in recent years

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trend of inclusive education in Indonesia was decreasing, with the evidence from the decline in the ranking presented by UNESCO on the implementation of inclusive education in Indonesia, which Indonesian achieved the best ranking is 58 out of 130 countries in 2008, then it ranking was declined each year. One of the main problem of the implementation of inclusive education in Indonesia is teachers management.

As stated in tribunjogja.com (2015) the number of special education teachers in the one of the largest province in Indonesia ie Yogyakarta province was still limited. Moreover Murniati (2017) also said that there was limited number of special education teachers in Solo, Central Java Province. Besides of limited number of special education teachers, competency of special education teachers in Indonesia is still low, as said by Sofiana (2017) whose explained about special education teachers experience when giving lessons or special program for disabbility students in Surabaya, East Java Province. The teachers face problem such as the variety characteristics of disability students, and also lack of knowledge and experience when giving several special compensatory program for disability students.

So, this research was done based on these questions. What are the problems in implementing the management of inclusive school's teachers in Indonesia ? What are the cause of problems in the implementation of inclusive school's teachers managament in Indonesia ? and How is the recommended inclusive model of inclusive school's teachers management in Indonesia?

Literature Review

The philosophy of Inclusive education is in line with Indonesia national motto, Unity in Diversity, which mean that diversity isn't a barrier but an unifier. Moreover, Smith (2015:44) stated that, inclusive is a commitment to engage students who have disabilities in each level of education that they possibly allow (Smith, 2015: 44). While the goal of inclusive education is practically educating people with disabilities in regular classes together with other people who do not have disabilities through appropriate support needs, both at school and in the neighborhood (Firdaus, 2010). So in inclusive schools, schools must adapt to the needs of all students, and ready to accept however the condition of students (Garnida, 2015: 56). It can be concluded that inclusive education is the education system that allow all students, doesn't matter their conditions, to get appropritae education services based on their abilities.

One of the important aspect in inclusive education implementation is teachers management. Based on General Guide of Inclusive Education Implementation in Indonesia (2011), teachers management is the management process that has a duties on : Organizing lessons, training, researching, intervening, and provide technical services in the field of learning. Also based on this guide, teachers in inclusive education is divided into three kind. First, is class teachers, class teachers have the duties and resposibilities on organizing lessons in class, include of making lesson plan, and also do an evaluation for each students in the class. Second one, is the special subject teachers. Special subject teachers have a same duties as class teachers, but only for several subjects such as : english, dance, vocational skills, and etc. The last one is special education teachers. Special education teachers have the duties and responsibilities on doing assement for disabilities students, making individual lesson plan, guiding disabilities students in class, giving compensatory program, making evaluation for disabilities students, and also creating workgroup which include of headmaster, class teachers, and parents for giving appropriate service for disability students

Method

This research was conducted by using the literature study method. Literature study is a technique to collect informations based on many refferences (mainly books) to solve the problems (Berliano, 2007), that was, the problem solving technique was done through the collection of discussions which were based on some literature such as books (referential books and other sources) . The literature sources used consisted of books, journals, articles, official reports, and also other informations to be collected in relation to the inclusive education management matters. The literature study in this research was divided into three stages; the data collection, the data analysis, and the conclusion drawing as shown in figure 1.

The process of collecting the data was done through selecting the data which had been collected before including various literature sources. The data used were connected to the implementation of the inclusive school's teachers management either in the form of research or thought in relation to same topic. In particular, the data found in relation to the implementation of the inclusive school's teachers management from any literature sources consisting of books, journals, articles, official reports, and other information needed to be selected to get the best technique that could be used to answer the research questions.

The next process was the data analysis. The data which had been collected needed to be analyzed to find the relevant facts to answer the research questions. The process of the data analysis in this research used meta-analysis with employed with inductive descriptive analysis technique. Descriptive means the systematic description about the things analyzed (Sukardi, 2016:157). While inductive is the technique for drawing the conclusion at the end of the process of the description done. So that the data in this research could be analyzed until it could find answer the research questions and also to develop effective model of inclusive school's teachers management. The final process of the literature study is drawing the conclusion based on the results of the data analysis.

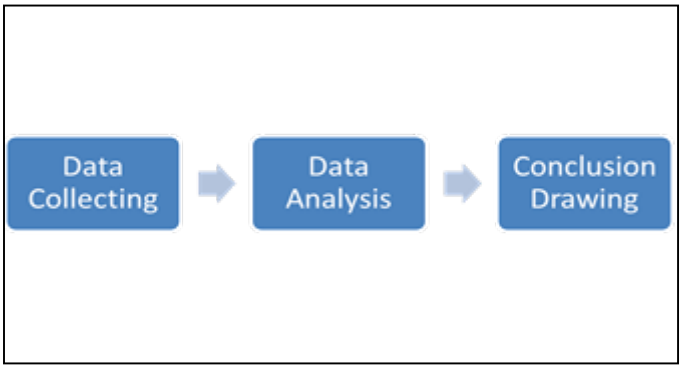

Figure 1 : Stages of Literature Study

Findings/Analysis

There were lot of research done in the topic of inclusive education management in Indonesia. This research was analyse results from several previous research as follows : Sunardi (2009), Sunanto (2009) on two inclusive schools in Bandung, Sunardi, et al (2011) on 186 inclusive schools, in Palembang (South Sumatra Province), Solo, Wonogiri, Sukoharjo, Karanganyar, and Boyolali (Central Java Province), and Makasar (South Sulawesi Province). Also research done by Wati (2014) in one inclusive school in Aceh Province, Yusuf, et al (2014) in 51 inclusive elementary schools in Central Java Province, Haryono

(2015) in 591 inclusive shools in Central Java Province, and the last one is research held by Zakia in four elementary schools in Sukoharjo.

Problem in implementation of inclusive school's teachers managament in Indonesia based on data analysis was shown in table 1 bellow :

Table 1. Problems in Inclusive School Teachers Management

No	Problems	Research by
1	Most of teachers, especially special education teachers didn't modified their instruction	Sunardi, et al (2014:7)
2	Most teachers were not specifically trained to manage heterogeneus classes	Sunardi, et al (2014:7)
3	There was no manual of inclusive education management for teachers yet, especially about role, duties, and resposibilities of each teachers	Yusuf, et al (2014:159)
4	Teachers didn't have adequate quality as teachers for disability students	Sunardi (2009:5)
5	Class Teachers didn't have sensitivity and proactivity yet to disability students	Sunardi (2009:5)
6	Teachers didn't held any routine discussion about giving services for disability students	Sunardi (2009:5)
7	Funding for teachers is still inadequate	Sunardi (2009:5)
8	The number of special education teachers in school is still limited	Wati (2014:377) Sunanto (2009:12) Zakia (2015:115) Haryanto, et al (2015:124)
9	Class teacher and special subject teacher has a tendency on special education teacher	Sunanto (2009:12)
10	Special education teachers didn't have courage to straighten the concept of inclusive education	Sunanto (2009:12)
11	Special education teachers have another duties, and responsibilities in schools such as being the class teachers	Zakia (2015:115)
12	Training for special education teachers is still inadequate	Haryanto, et al (2015:124)

Based on the result shown in table 1, it can be concluded that the main focus on inclusive school teachers management is special education teachers. Special education teachers have an important role in order to implement appropriate inclusive education. It can be shown from 12 problems in management of school teachers, five of that is happen specially on special education teachers, include of : special education teachers didn't

modified their instruction, the number of special education teachers in school is still limited, special education teachers didn't have courage to straighten the concept of inclusive education, special education teachers have another duties, and responsibilities in schools such as being the class teachers, and also training for special education teachers is still inadequate. Problems in special education teachers caused by lot of factors. The number of limited special education teachers is in line with the small number of universities in Indonesia that have a special education study program. Moreover, special education teachers that can't modified their instruction and also didn't have courage to straighten the concept of inclusive education, can be caused by lack of knowledge and experience that special education teachers have or special education teachers in school didn't graduate from special education study program. When special education teachers being class teachers, can be happened because of headmaster and another teacher didn't have appropriate concept about the roles, duties and responsibilities of special education teachers.

Furthermore, causes of another problems in the implementation of inclusive school teachers management is limited training program and socialization in context of inclusive education implementation for all teachers, which affected in: most teachers were not specifically trained to manage heterogeneus classes, teachers didn't have adequate quality as teachers for disability students, teachers didn't held any routine discussion about giving services for disability students, class teachers didn't have sensitivity and proactivity yet to disability students, and also class teacher and special subject teacher has a tendency on special education teacher.

While the government especially education authorities causes there was no manual of inclusive education management for teachers yet, especially about role, duties, and resposibilities of each teachers. and funding for teachers is still inadequate. Eventhough education department already create General Guide of Inclusive Education Implementation in Indonesia (2011), maybe its socialization can't be spread evenly. Moreover about the funding, its based on each province to manage funding for inclusive education, based on province income. So province with low income level, might be have problem in funding.

So in order to cope this problems explained before, model of inclusive school's teachers management must be created. Basically, the model of inclusive school's teachers management is not far different from the school management in common which emphasizes cooperation to reach the goals of education at schools through implementing the principal management on its implementation (Hermanto, 2010:73). Moreover Yusuf, et al (2014:160) stated that inclusive education management includes the process of planning, organizing, implementing, and controlling aspects of the inclusive education management involving: institution, curriculum, learning process, assessments, the student interrelation, teachers, facilities, community involvement, and budgeting. Furthermore, Bubpha, et al (2012:228) explained that model of the inclusive education management in Thailand includes three main processes. They are input, process, and output. The input process is arranging learning plans collaboratively and creatively. The process of implementation is the process of selecting, connecting, adapting, getting relevance, and testing. While the output process focuses on the graduate quality to clarify the needs, to determine the attainment, to design the working plan, and to check the activities.

So based on the explanation above, the recommended model of the inclusive school's teachers management is model of school-based management, which is the model gives autonomy to schools to manage the teachers by maximizing the use of school resources beside of another resources. The selection of school-based management model is strengthened by opinion of Sunaryo (2009:5) whose reveals the importance of utilizing and distributing the resources provided at schools to implement the inclusive educatio

Furthermore, Waitoller and Artiles (2013:347) explain that the success of the inclusive education is based on the school parties' works through meaningful process with the system that may develop. But also the support from the government is also needed (Wati, 2014:377). Hence, based on the analysis, the model of the school-based management for inclusive school's teachers management is showed in the following figure.

Figure 2. School-Based Management Process

School-based management for inclusive school's teachers management above conducted by the principals, teachers, community (including parents), as well as the government. With the implementation of each management process optimally uses available resources at school, which main activities in each section is :

1) Planning
   Planning is an activity to determine the roles, duties, and responsibilities of each kind of teacher include of : class teachers, special subject tachers, and special education teachers. This process conducted by principals with collaboration with teachers, or education authorities, if it needed
2) Organizing is the process of determining class grade level for each teachers. This process is based on condition of disability students on each class. This process conducted by principals with collaboration with teachers, and also by discuss with parents.
3) Implementing
   The main processes of school-based management for inclusive school's teachers management is the implementation of plan that already made before. In this process teachers must do their role, duties, and responsibilites well, also its really important for teachers to have routine discussion in context of giving lesson and program for disability students.
4) Monitoring
   Monitoring is continuous process through mutual checking between all doerto ensure that the management is done well. Especially this process can be done by principals, community (such as parents), and also government (especially education authorities).

Recommendation

In this research it can be concluded that : (a) There are 12 problems in management of inclusive school's teachers in Indonesia, and mainly happen on special education teachers, another problems happen in all kind of teachers (b) Problems caused by lots of factors include of : lack of knowledge and experience, lack of training program, and government support especially in manual of inclusive education and funding (c) recommended model for inclusive school's teachers management is school-based management with the following stages : planning, organizing, implementing, and monitoring.

Based on this conclusion, it is reccomended that principals, teachers, community, and government must be work together by following management process properly. In more detail :

1) Principal must oversee implementation of each teacher's duties, as well as provide solutions for the implementation of teachers management, and cooperate with other relevan section.

2) Teachers should be able to implement duties well through discussions and develop competencies through various activities

3) Community especially parents should done routine monitor in implementation of teachers management, and also actively joining inclusive schools discussion.

4) Government must do wider socialization about inclusive education manual, and also make a special allocation for teachers in inclusive schools.

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Developing the Teaching Material to Improve English Speaking Skills Through Lesson Study in STKIP BIM Surabaya

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Abstract

This study aims to develop English language learning modules, especially speaking skills to support curricular demands in accordance with the KKNI (Indonesia's National Qualification Framework) Curriculum and the world of work as the purpose of the College of Teacher Training and Education. The development of English language learning module focused on speaking skills is intended to complement teaching materials so that the acquisition of English speaking skills that match the field of teaching training and education can meet the competence of students life skill. Data collection techniques use observation sheets and interviews. Implementation of teaching materials using Lesson Study in collaboration with English lecturers in STKIP Bina Insan Mandiri and applied in English education departement. All data collected were analyzed qualitatively. The results of data analysis can be concluded that the English lecturers in STKIP Bina Insan Mandiri still need a supplement module in accordance with the field of students study as a complementary material for reading recommended by kemenristekdikti (Ministry of Research and Higher Education). The result of the use of speaking materials Lesson Study shows that students are more active and responsive following the lesson by learning the vocabulary related to teaching training and education as well as practicing speaking in various situations. The result of this research also shows students feel enthusiastic and motivated to learn English related to their majors and enjoy practicing speaking with friends and lecturers in the classroom using English fluently.

Keywords: *Implementation of Lesson Study, Teaching Materials, Teacher Training and Education Science.*

Introduction

Formal education is ranging from early childhood education to higher education in universities / colleges. Education is a process of gaining experience as a learning process. Learning is seen as a process which is a series of efforts or activities of educators in order to make students / college students in the university obtain the knowledge and skills expected in accordance with the learning objectives listed in the applicable curriculum. Learning process is a system and involves a number of organized components such as learning objectives, materials or teaching materials, strategies and learning methods, learning media, evaluation and follow-up of learning in the form of remedial or enrichment. The learning given is expected to be able to develop the ability of learners and form the character and civilization of dignified nation in order to educate the life of the nation in order to become be cautious, noble, knowledgeable, capable, creative and independent person in accordance with national education objectives.

English learning which is compulsory subject of study program / institution in every university is arranged according to the principles of current curriculum, which has been

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determined by using reading source recommended by Kemenristekdikti. The reading sources consist of module / hand out / textbook readings and books available on line. But the intended books for speaking subject are still general and only for general knowledge, even difficult to distinguish between one book and another in terms of its usefulness. Thus the teaching material in English textbooks is general in both the text and the vocabulary provided for the learning at the College of Teacher Training and Education Science. But in fact the competence of English for graduates of Teacher Training and Education Science is very important to support the competence of graduates that is as a candidate a teacher learners.

The graduates of STKIP Bina Insan Mandiri are expected to not only be able to get jobs as English teachers in domestic schools but also to compete for employment opportunities in foreign schools / international schools in Indonesia or even become a professional teacher at school in overseas. This resulted in the lecturers in STKIP Bina Insan Mandiri was experiencing various problems in the learning process.

Based on the experience of lecturers in the field, in general they, the lecturers, do not use the package fully as a source of reading obtained to teach students English language courses, especially in the environment STKIP Bina Insan Mandiri, so that additional material in accordance with the field of teacher and science An indispensable education, as a professional teacher printers in the world of education. From some of these problems, some lecturers add teaching materials obtained from the internet, or obtained from other sources whose material is in accordance with the field of teacher training and education science at STKIP Bina Insan Mandiri. Similarly, it happens in most other high schools and universities, where lecturers teach in English education courses that have used in college. Sources of reading / textbooks used in English teaching have not touched the teacher's competencies and the educational sciences needed to develop the self-potential of students who are ready to work and able to compete with the outside world in facing the global era in education. Sources of books / books that have been arranged systematically for speaking in teacher training and education science subject did not accommodate material relevant to the needs of students STKIP Bina Insan Mandiri Surabaya. Speaking skills presented in the package book is still less intensive and has not supported the competence of student skills which is certainly required in the world of work as a professional educator English proficiency. Therefore, the research result of this article is in the form of material / teaching materials for English lecturers in STKIP Bina Insan Mandiri Surabaya as English language supplements especially for speaking skills that are planned as the development of speaking materials on the students of English Education Department at STKIP Bina Insan Mandiri Surabaya.

Collage of teacher training and education science at Bina Insan Mandiri has several courses, one of which is the English education departmnent. By using Indonesia's National Qualification Framework Curriculum, speaking learning in English education department is still general, the vocabulary used is less related to the field of education and teaching, especially in the development of teaching materials in accordance with the needs of student life skills. It does not distinguish the substance of the material for teacher speaking and education with general speaking / public speaking, so that both high school and university students get relatively equal and in-depth English language material in their use, especially in the field of teaching English in formal schools .

This fact is supported by the results of questionnaires of lecturers and students at three institutions in a foundation involved in this research, namely STKIP Bina Insan Mandiri, ASMI (Academy of Sekretary and Management of Indonesia), and UWP (University of Wijaya Putra). The results of the questionnaire indicate that the material for speaking is still very common in each institution and has not been able to facilitate students in developing their speaking skills especially to face the world of work in the field of education. The

teaching of speaking material in the English education course which has not yet touched on the conversation about the manner or behavior of someone related to the education material such as how to behave and behave In the execution of scientific activities, how to speak and discuss in the class, how to lead class discussions related to teaching learning, and so on. This case makes the lecturers have to develop the material with their own creativity that is adapted to the current curriculum.

With the emergence of these facts then the researcher decided to pursue research and focus on only one field of study ie teacher training and education related to formal teaching, because the material requirement in English education department of STKIP Bina Insan Mandiri that is very urgent is needed. Another reason that underlies the selection of English language education courses is because the English education program is a study program that is in great demand in the era of today's Asian economy, given the English language is an international language, the use is needed in all circles especially in the world of education . Use of speaking in the world of education is instrumental in improving the quality of human resources. So the procurement of reading resources as special teaching materials in the world of education is very important, to use the module of speaking material in teaching that is implemented directly, especially in conversation or English communication in the real educational setting.

The objectives of the research are: (1) To conduct teaching action in the form of Lesson Study to develop the quality of teaching materials / Speaking materials for English education study program (2) Increase student activity in learning English especially speaking skill (3) Creating a learning module Speaking as a supplement book whose level of effectiveness can be accounted for

This material is implemented through Lesson Study conducted on the third semester of English education students in the new academic year 2016/2017 at College of Teacher Training and Education Science Bina Insan Mandiri by basing on the principles developed in the curriculum college. The learning of speaking in high school teacher and education sciences has not been directly oriented in the educational context of the field. The learning materials that exist so far are oriented towards the achievement of students to get the best value at the end of the lecture process. Contextually or environment-oriented learning is absolutely necessary for STKIP Bian Insan Mandiri students of English education studies to speak their skills according to the application in the world of work. This research is oriented to the creation of environmentally friendly speaking learning module that will contribute to the learning process of English in STKIP Bina Insan Mandiri especially on speaking skills in English education department.

The end result of this study will be very useful for students, lecturers, and researchers learning English especially in collage of teacher and education. Lecturers need not hesitate, confused in selecting the material and experimenting with contextual learning model based on environment / education world. Similarly with students, they will feel the real benefit in communicating by using English directly by applying the English they get in accordance with the social environment in their daily lives.

Literature Review

Most people define narrow speech skills. Traditionally, many people have defined speaking skills as a person's ability to make public speeches. But Brown (2001) provides a broader definition, he defines speaking skills as activities that reflect varied settings; Which may occur between a person and a crowd, communication in a small group, someone with someone, or with mass media. The other opinions interpreting as a special ability that someone needs for everyday activities, such as giving directions, information, seek

information, and so forth. And, the emergence of an approach to communication for university students at collage, where there is a broader view that oral communication is an interactive process where individuals take part as speakers or as listeners involving verbal and non verbal language. In other words, speaking skill is a competency that one needs to engage in verbal and non-verbal interactions with others, with the aim of conveying information, influencing or negotiating to reach mutual agreement (Richards & Renandya, 2002, and Gebhard 1994) Especially in education.

Harmer (2001) adds the definition of speech as the primary means for fostering mutual understanding, mutual communication, using language as the medium. The speaking activities in the language class have a two-way communication aspect, between the speaker and the listeners on a reciprocal basis. Thus speaking practice must first be based on: (1) listening ability, (2) speech ability, and (3) mastery (relative) vocabulary

The learning process of environment-based speaking skills will promote the use of the environment as media and learning resources. In college-level education the lecturers should be able to provide a clear concept and understanding of learning to speak based on what they see and transfers related to education in the neighborhood. Environmental-based learning is divided into two stages:

1. Pre Communicative Activities which presents some of the following:

A. Understanding the concept of state-based speech in the neighborhood (class and campus).

B.Techniques Technique

Lecturers should first determine the basic subject matter that includes the structure and vocabulary.

C. Object-based guided dialogs in the neighborhood

The lecturer gives drill exercises in the form of question and answer. For example: What do you think of the trees in our school? Then the students answer in accordance with the dictation, namely; There are some big trees ... The leaves fall down because of the wind.

2. Communicative activity, presents several things, including:

A. Group conversations

Lecturers divide the class into groups that each group has a chair. The students took and turn to say something and then spliced by a group of friends so that it became a whole story about what they saw around them.

B. Play role

In this activity the lecturer assigns certain role assignment which must be done by the students. The role given should be adjusted to the level of language mastery of the learners. For example, when the theme of learning about campus activities, teachers can provide the role of principals, teachers and students in role play. The content of the conversation must be in accordance with the state of the school at that time.

C. Social Phrase Practice

Social expression means social behaviors when one communicates verbally with another person, such as: saluting praise, congratulating or asking for polite and other help, tailored to the role played by each actor.

D. Answering questions based on experience

Questions relating to what students have experienced are helpful for them to respond easily. Thus they can express ideas or opinions / opinions according to what is experienced.

E. Creating an English Zone, a place where students must use English as a means of

communication between them. This requires a sanction agreement that is given and is constructive when among them there is a violation of the rules that have been determined.

F. Play language games

Games or games can require students to speak English, using the student's game to feel good about practicing English.

G. Troubleshooting (Problem Solving)

In this activity, students will be invited to think critically about what is happening in their environment. By looking at the reality that exists within the environment, students will learn how to understand and analyze social and environmental problems and find solutions to the problems that exist.

The above learning stage is an activity that can be implemented outdoors where students can learn through their experience gained in a broader and tangible scope, that is the environment around them.

In fact, lecturers are required to try to make the material delivered can be understood and understood learners. Various techniques that can be used by lecturers to train students to speak (speaking) actively with learning materials that suit the environment, among others, is in teaching in education for students of English education courses. Speech skills materials that have many processes need to be supported by the tools or learning media, such as images or cards that allow students to use the means of the senses optimally. The more sensory devices used to learn everything, the easier it is to remember what is being read and learned. Based on this matter Speaking is presented with assisted media images and cards (situational card) used by students to present the process of speaking exercises directly with the easier.

Design/Procedure

This research is research development or an educational research and development. According to Borg and Gall (1983) research development is a research oriented to developing and validating the products used in education. The type of data in this study is qualitative data in the form of observation data, interviews, questionnaires and test material from a team of educational experts. This research is based on the Borg and Gall research model which has three stages. The first is to analyze the need for the purpose of collecting information by reviewing the English textbook recommended and exploring the need for learning to speak in accordance with the environment of teacher training and education. Second is the learning design phrase. This stage aims to develop the design of learning to produce a draft learning module that focuses on learning to speak as complementary material English textbooks based on curriculum. Finally, the third stage is the use of speaking skills in English language learning in the classroom by applying the Lesson Study and validating the learning-learning module with the material test by education experts. This stage aims to determine the effectiveness and flexibility of learning modules of speaking skills subject to the field of study for students in teacher training and education science especially in STKIP Bina Insan Mandiri Surabaya.

In this study the researcher apply the English learning module that focuses on speaking material in English education course class with Lesson Study (LS) in collaboration with one lecturer of English education program in that class as a lecturer model and two other English lecturers as observers in the implementation of Lesson Study. The subjects of this study are students of English language education department at the third semester in STKIP Bina Insan Mandiri, amounting to twenty students. In running this Lesson Study, there are three steps that must be implemented: Plan, Do, See in one cycle. The first step is lesson study planning conducted by Lesson Study team, that is designing, planning, determining

learning strategy for speech skill material that will be presented. And determine the indicators to be observed during the learning process (Plan). The second step is the implementation of learning in the class (DO) conducted by the model lecturer and accompaniment by two other lecturers who simultaneously acted as observers and two other English lecturers from the same institution. This observation focuses on the activities and behaviors of students during the learning / lecture activities take place. Each observer looks at a group of students for their activities and abilities in following the learning / lecture activities in the classroom. The third step is to reflect by the lesson study team: model lecturers and observers on the implementation of learning, especially when the activity reports the observation of student activities and responses during the learning / lectures activities take place by providing feedback or suggestions as input for next cycle improvement (See).

The implementation of this Lesson Study is conducted bi-weekly during two hours of study because it is alternated with the provision of English speaking materials from reading sources contained in the RPS (Semester Implementation Plan) and RPP (Learning Implementation Plan) based on the current university curriculum.

The instruments of data collection used are observation sheet and interview guide. The observation sheet is used as a guide to know the students' activity and responsiveness to speaking learning materials related to the field of student interest in absorbing knowledge during lecturing. While interviewing guidelines used to know the impression, student messages and appeal to the learning module for students in general and the motivation to learn more about the vocabulary / terms used in teaching English. Questionnaires are used to obtain data relating to the quality of eligibility of the materials or appropriate learning modules and messages and suggestions of perfection to the learning module from the educational expert team.

The data type of this research is qualitative data. The data were analyzed descriptively qualitatively by describing the result of narrative observation described descriptively. Data obtained through observation sheets, interview sheets and questionnaires are analyzed descriptively qualitatively in depth by looking at the phenomena that appear in the field / lecture activities in the classroom. To answer the existing problems, the researcher conducted random in-depth interviews on several competent students, lecturers and collected data through questionnaires supported by documentation made during the learning process / lecture activities.

Findings/Analysis

This research uses Research and Development method which is oriented to open lesson or Lesson Study which is divided into three stages, namely Plan, Do and See. The data of this research are (1) improvement of student activity and response to English language material especially on Speaking skill and (2) teaching material design Special Speaking for English class in English Education Study Program as English language supplement for speaking subject.

In the stages of the plan, determined learning strategies that will be used with the planning steps as follows: (1) determine the learning materials; (2) determining indicators to be observed during the learning process, (3) asking students to study the material in a learning process; And (4) to inform that the class will be used as a lesson study model class by using research textbooks based on curriculum of college of teacher training and education science.

At the stage of do, the model lecturers carry out the learning process in the course activities by using learning-learning module as a complementary material / reading source for speaking courses based on the curriculum of college, with the following stages: (1) model

lecturers show the pictures, words, situations relating to the material delivered. With the guidance of the lecturers concerned, students connect the images with their real experiences; (2) the lecturer gives an example of dialogue and asks students to practice it; (3) with examples of existing dialogue, in the Re-constructing stage, students are asked to ask questions by using questions in the dialogue that are already available in the module according to their experience; (4) at the producing stage, students are asked to create a dialogue in the form of question and answer by using a role card (situational card) developed based on their understanding and reality, (5) in the final stage students in pairs are asked to present their developed dialogue in front of the class lectures and other students are entitled to respond. In the process of learning, there are two English lecturer who serve as observers with the task to observe the increasing participation and activeness of students during the process of lectures in the learning takes place.

The success indicators of this research can be seen in the following table 1 bellow :

Table 1. Success Indicators

No	Indikator	Before	After
1	Product of speaking learning module	The absence of books that suit the needs specifically in the world of education in teaching with effectiveness level of student ability	The creation of products that match the needs of student life skill in English class
2	Speaking Skills STKIP Bina Insan Mandiri Surabaya students in accordance with the needs of the market & student life skills	Not maximal vocabulary / vocabulary use related to teacher training and education in student speaking skill during use of curriculum based resource of Indonesia's National Qualification Framework at college	Student's speaking skills in accordance with the field of study and life skills needed in the workplace Especially in the field of teaching in education
3	Activity and student participation during the learning process	Students learn the individual and learn partial speaking skills with general materials so that speaking skills are still very minimal for communication media in the world of work	Students participate actively and responsively in learning especially in group activities where they freely collaborate and express ideas through the guides of learning materials

Lesson Study which is the orientation of Research and Development Research. This is

a step to improve the condition of student learning, especially in speaking class in English education program STKIP Bina Insan Mandiri Surabaya. This step is taken as a reaction to the lack of student skills in the third semester, especially in using English as a medium of communication in the world of education in teaching. As the first step of this research, the researcher designs a teaching material that is tailored to the needs of the students as well as the market needs, especially in the world of education in teaching.

The study, which was presented in the form of open lesson or lesson study, carried out five cycles (Plan-Do-See). Each cycle is held every two weeks in English class STKIP Bina Insan Mandiri with two lecturers as observers. The implementation of open lesson is quite successful in implementing teaching materials, especially in improving students' activeness and participation during the learning process.

Based on observations from some observers indicate that the activeness of student participation in following learning increased significantly. Understanding students toward teaching materials given lecturers quite well with the introduction of vocabulary and terms related to the world of education in teaching. By using learning media students practiced speaking skillfully enough to reconstruct dialogue according to the class conditions they played in English.

Some things that become the benchmark of Lesson Study success in this research are: first, before the implementation of Lesson Study, students learn English common even though they learn in English class is general and passive, especially study program of English education at STKIP Bina Insan Mandiri. This resulted in the students can not learn English material to the maximum according to their needs in the field of teaching. With the optimum use of environment-based teaching materials in this case the use of language related to English teaching in English class which is considered very effective to introduce new vocabulary related to education and teaching English. Furthermore, this teaching materials will equip students with good English skills to meet the need for education in English teaching in Indonesia, especially in the environtment of STKIP Bina Insan Mandiri

Recommendation

Some things that become the benchmark of Lesson Study success in this research are: first, before the implementation of Lesson Study, students learn English common even though they learn in English class is general and passive, especially study program of English education at STKIP Bina Insan Mandiri. This resulted in the students can not learn English material to the maximum according to their needs in the field of teaching. With the optimum use of environment-based teaching materials in this case the use of language related to English teaching in English class which is considered very effective to introduce new vocabulary related to education and teaching English. Furthermore, this teaching materials will equip students with good English skills to meet the need for education in English teaching in Indonesia, especially in the environtment of STKIP Bina Insan Mandiri.

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Why Do Japanese Elementary Teachers Adhere to the Order of Factors in Multiplication? From a Perspective of Curriculum Sequence:

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Abstract

In Japanese elementary school mathematics, teachers often teach multiplication adhering to the order of factors: (multiplicand) × (multiplier). For example, in a word problem such as "There are 5 dishes. There are 3 apples on each dish. How many apples are there?" they tend to encourage students to calculate by "3 × 5 = 15", not permitting to calculate by "5 × 3 = 15". And such teaching with emphasis on this order can be continued even after introducing commutative property. Most teachers know that it is so as to distinguish clearly between multiplicand and multiplier. However, it seems that they do not necessarily recognize why such clear distinction is important in relation to curriculum sequence. The purpose of this paper is to clarify necessity to emphasize the order of factors in multiplication in Japanese context by analyzing subject contents related to this order from a perspective of curriculum sequence.

The result of the analysis clarifies that it is necessary to teach multiplication emphasizing its order of factors by some following reasons: 1) To construct multiplication tables so that it is easier to memorize and without contradiction between meaning of multiplication and the order of factors, 2) To clarify the distinction between two meanings of division (quotative and partitive division), but on the other hand, to unify ways of calculation into multiplication, and 3) To extend the meaning of multiplication to multiplication as "rate" without confusion when teaching multiplication of decimal numbers. And it is mentioned that this is because of Japanese context such as: 1) word order in Japanese language, 2) Japanese words equivalent to English word "times", and 3) Distinction between "expression" and "calculation" in Japanese elementary school mathematics.

Keywords: *Curriculum sequence, Elementary school mathematics, Multiplication*

Introduction

In Japanese elementary school mathematics, teachers often teach multiplication adhering to the order of factors. The order of factors in multiplication in this paper is defined as the order of multiplicand and multiplier. In Japan, the order of (multiplicand) × (multiplier) is general, the title of this paper indicates situations where teachers adhere to that order. For example, in a word problem such as "There are 5 dishes. There are 3 apples on each dish. How many apples are there?" they tend to encourage students to calculate by "3 × 5 = 15" instead of "5 × 3 = 15" thinking 5 as multiplier and 3 as multiplicand. The answer by the opposite order (multiplier) × (multiplicand) may be even incorrect. And such teaching with emphasis on this order can be continued even after introducing commutative property.

Most teachers know that it is so as to distinguish clearly between multiplicand and multiplier; which factor is multiplicand and which factor is multiplier. However, it seems that they don't necessarily recognize why such clear distinction is important in relation to curriculum sequence, in other words, how such distinction is significant in teaching other subject contents. The purpose of this paper is to clarify necessity to emphasize the order of factors in

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multiplication in Japanese context by analyzing subject contents related to this order from a perspective of curriculum sequence.

Literature Review

1) Description in Guide for current Course of Study

According to the current Course of Study revised in 2008, multiplication is introduced in grade 2. The Guide for Course of Study, which explains in detail about the Course of Study, multiplication is defined as follows (MEXT 2008, p.75; Isoda 2010, p.133):

> Multiplication is used to find how many objects there are in so many units when the number of object for one unit is known. That is, multiplication is used to simplify the expression of adding the same number over and over; in other words, a concise expression of repeated addition. Furthermore, the meaning of multiplication as repeated addition may be considered as a way to find the amount that is so many times as many as the base amount.

In this definition, "number for one unit" corresponds to the multiplicand and "so many units" or "so many times" corresponds to the multiplier. As for the order of factors, it is not mentioned explicitly.

However, the order of (multiplicand) × (multiplier) is suggested in every description in the Guide. In fact, in all textbooks used in elementary school today, this order is adopted to introduce multiplication (**Figure 1**). From grade 2 until grade 6, even after introducing commutative property, which is mentioned as a property which hold for multiplication in grade 2, and introduced officially and explicitly in grade 3, the order of (multiplicand) × (multiplier) is maintained consistently in teaching multiplication. The first time when an opposite order appears is in secondary school, when expressions with letters are introduced and they express for example "2a" according to the rule.

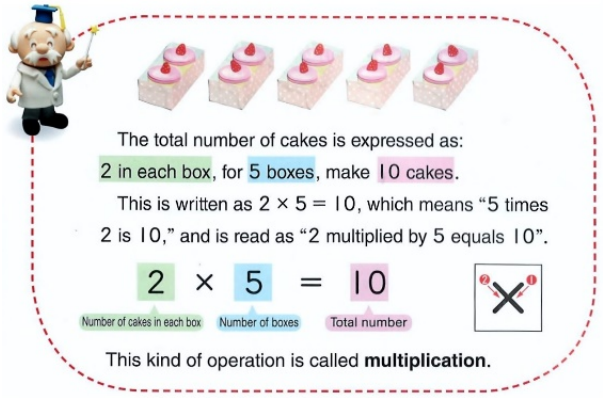


Figure 1. Definition of multiplication in a textbook (Hitomatsu & Okada, 2015a, p. 9)

2) Argument about the order of factors in multiplication and mention in Guide for next term Course of Study

In Japan, the order of factors in multiplication has been taken up in mass media from the old days, and has been frequently discussed (e.g. Asahi Shimbun, 1972, 2013). In recent years, it has been taken up and discussed also in SNS etc. **Figure 2** shows the student's answer which was evaluated as inappropriate by his/her teacher, because he/she wrote "5 × 3 = 15" by the order of numbers which appear, instead of answering "3 × 5 = 15" by the agreed order. In this argument, some support this teacher's evaluation, others criticize it from various viewpoints. As a result, some blogs which explain this problem in detail appear (e.g. Wasakki, 2013), and a book about this theme was published (Takahashi, 2011).

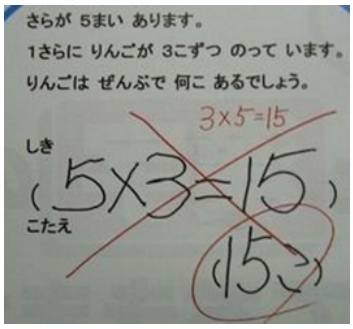


Figure 2. A student's answer evaluated as inappropriate by his/her teacher in the word problem: "There are 5 dishes. There are 3 apples on each dish. How many apples are there?" (Wasakki, 2013)

Mainly, opinions that support this teacher are that it is so as to represent the meaning of multiplication clearly according to the order agreed, and for teachers to confirm students' understanding which number for one unit is and which so many units is. On the other hand, criticism of this teacher can be classified into three points as follows (Takahashi, 2011):

1) By commutative property of multiplication, $5 \times 3 = 3 \times 5$ holds.
2) If counting one by one from each dish and focusing on the times to count, we can regard 5 as multiplicand and 3 as multiplier.
3) In other countries, the opposite order (multiplier) × (multiplicand) is used, and/or the order of factors is not considered.

The Ministry of Education, Culture, Sports, Science and Technology (MEXT), which had not shown clear guidelines on this matter so far, presented a certain direction in the Guide for the next term Course of Study revised in 2017. MEXT (2017) mentions explicitly "To represent 'number of oranges which corresponds to 4 dishes in case each dish contains 5 oranges', we write at first 5 which corresponds number for one unit and note 5×4. … In other words, multiplication is considered as (number for one unit) × (so many units) = (Number which corresponds to so many units)" (p.114). Moreover, it is also mentioned that in the previous example, it is possible to represent $4 + 4 + 4 + 4 + 4$ if counting one by one from each dish and focusing on the times to count, and it has to pay attention that there are some countries where the opposite order of factors in multiplication is adopted. In addition, it is shown that when calculating for the result, they can reverse multiplicand and multiplier by applying commutative property.

3) From viewpoints of international comparative study

Makoto Yoshida, one of Japanese mathematics educators in the USA, points out that while the order of (multiplier) × (multiplicand) is general in the USA, there are textbooks and teachers which/who do not adhere to the order of factors nor clarify the meaning of factors, contrasting with Japan, where they teach clearly multiplicative situation with the order of multiplicand (number for one unit) and multiplier (so many units) (Yoshida, 2009). Isoda & Olfos (2011) analyzes the order of factors in multiplication focusing on difference of language in comparative study between Japan and some Hispano-American countries. It points out that in the order of (multiplicand) × (multiplier) based on Japanese word order, there is no contradiction in constructing multiplication tables by repeated addition. On the other hand, in the order of (multiplier) × (multiplicand) based on Spanish word order, contradictions can appear, so it is necessary to take some measures such as introducing commutative property in early stage.

4) Justification for this paper

In elementary schools in Japan, defining multiplicand as number for one unit and multiplier as so many units, they teach multiplication with the order of (multiplicand) × (multiplier)

consistently. This is so as to distinguish clearly between multiplicand and multiplier by the order agreed. In spite of various criticisms, its necessity is shared by most teachers (This is an issue in teaching and learning in classroom. As misunderstood in some arguments, whether to make incorrect the opposite order in exams is an issue of another dimension). In fact, such purport was shown explicitly in the Guide for next term the Course of Study. It can be said that this is one of characteristics of Japanese elementary school mathematics.

Then, why is it so important to distinguish clearly between multiplicand and multiplier by the order of factors? We can say simply this is due to the agreement, but it is necessary to justify it more. So, this paper aims to consider how it is significant in relation to the curriculum sequence, in other words, so as to teach other subject contents. In fact, it seems that such importance is not sheared between teachers.

Analysis of subject contents

In this section, I pick up some subject contents related to the order of factors in multiplication and analyze how they can be related to the teaching with emphasis on the order of factors. As related subject contents, I chose the following themes: 1) Construction of multiplication tables, 2) Meanings and ways of division, and 3) Multiplication of decimal numbers. These are chosen as contents where remarkable relation with the order of factors in multiplication can be seen, so there is no intention to limit to only three contents. In order to analyze these contents, I use mainly the Guide for current the Course of Study (MEXT, 2008) with its English translation (Isoda, 2010) and a series of textbooks edited by Gakko Tosho "Study with Your Friends Mathematics for Elementary School" with English version.

1) Construction of multiplication tables

Regarding multiplication tables, MEXT (2008) mentions the importance for students to construct by/for themselves while discovering patterns in the table, and the importance for them to become proficient in using the multiplication tables. However, there is no description about how to construct multiplication tables concretely. It means that the common and unique way to construct multiplication tables is shared in Japan. That is, for example, the table of 2 indicates $2 \times \square$, and is composed from $2 \times 1 = 2$ to $2 \times 9 = 18$. It means repeated addition of 2, and can be constructed by increasing by 2 (**Figure 3**)

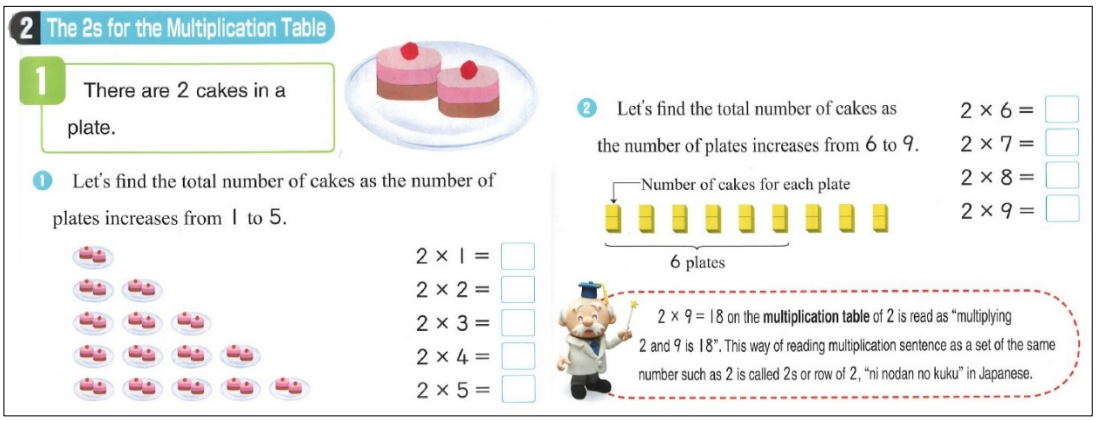


Figure 3. Construction of multiplication table of 2 (Hitomatsu & Okada, 2015a, p.15)

Although it is too commonplace to be conscious, it can be possible by the order of (multiplicand) × (multiplier) defining multiplicand as number for one unit and multiplier as so many units, as Isoda & Olfos (2011) mentioned. As many Western language speaking countries suffer, with the order of (multiplier) × (multiplicand), if constructing by repeated addition, the

table of 2 is □ × 2; 1 × 2, 2 × 2, 2 × 3…, so it is difficult to memorize. If the table of 2 is defined as 2 × □, its meaning can be 1 + 1, 2 + 2, 3 + 3…, so it cannot be repeated addition. Furthermore, if trying to make compatible 2 × □ and repeated addition of 2, contradiction with word order occurs. With the order of (multiplier) × (multiplicand), they have some contradiction in any case.

In Western languages speaking countries, such a contradiction often leads to obscurity in the order of factors in multiplication. On the other hand, in Japan, it can be said that they can maintain the order of (multiplicand) × (multiplier) because there is no such contradiction. Speaking paradoxically, by adhering to the order of (multiplicand) × (multiplier), the tables of multiplication can be constructed with easier way using repeated addition and without any contradiction between the meaning of multiplication and the order of factors.

2) Meanings of division

Regarding division in grade 3, MEXT (2008) shows two situations where divisions are used (MEXT 2008, p.110; Isoda 2010, p.133).

> One is a case of quotative division where one has to find how many times as much one number or quantity is as the other number or quantity. The other case, called partitive division, is to find one part of an equally divided number or quantity. Quotative division can be thought of as division based on the idea of repeated subtraction. For example, the meanings of 12÷3 are: dividing twelve candies equally by three people (partitive division), and dividing twelve candies into groups of three (quotative division).

As for ways of division, it describes as follows. (MEXT 2008, p.110; Isoda 2010, p.133).

> Division can be thought of as the inverse of multiplication. Therefore, as it relates to multiplication, it is important to clarify which of the two values is being sought, the one corresponding to the multiplier or the one corresponding to the multiplicand. Partitive division is where □ in □ × 3 = 12 is sought, and quotative division is where □ in 3 × □ = 12 is sought. It is important for students to realize that when we divide in the real world, we can divide things in a partitive way or a quotative way; students should thereby understand that both types of division can be expressed by the same algebraic expression.

As shown in the textbooks (**Figure 4** and **Figure 5**), the partitive division can be explained with (number in total) ÷ (so many units) = (number for one unit), and the quotative division with (number in total) ÷ (number for one unit) = (so many units). While multiplication can be explained by one expression: (number for one unit) × (so many units) = (Number which corresponds to so many units), division -its inverse- is classified into two depending on whether number for one unit is unknown or whether so many units is unknown. This distinction can be easier to explain by identifying which one is number for one unit or so many units. That is, these numbers correspond to multiplicand and multiplier, and by distinguishing them, they can distinguish two meanings of division.

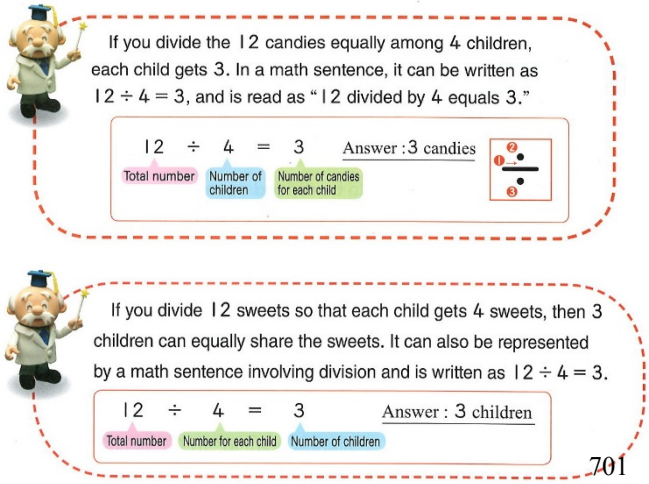


Figure 4. Explanation of partitive division (Hitomatsu & Okada, 2015b, p.38)

Figure 5. Explanation of quotative division
(Hitomatsu & Okada, 2015b, p.42)

On the other hand, in both cases, the multiplication is used to calculate division. Although division (especially quotative division) can be calculated by subtraction if regarded as repeated subtraction, in Japan it is general to use the multiplication tables which already have been learned. For example, in **figure 6** and **figure 7**, it shows 15 ÷ 3 of partitive division and of quotative division respectively. Both divisions can be calculated by the table of 3. But both situations are distinguished by representing unknown number with □; □ × 3 =12 for partitive division, and 3 × □ = 12 for quotative division.

In this way, by adhering to the order of factors in multiplication, it can be easier to clarify the distinction between two meanings of division but on the other hand, to unify ways of calculation into multiplication integrally.

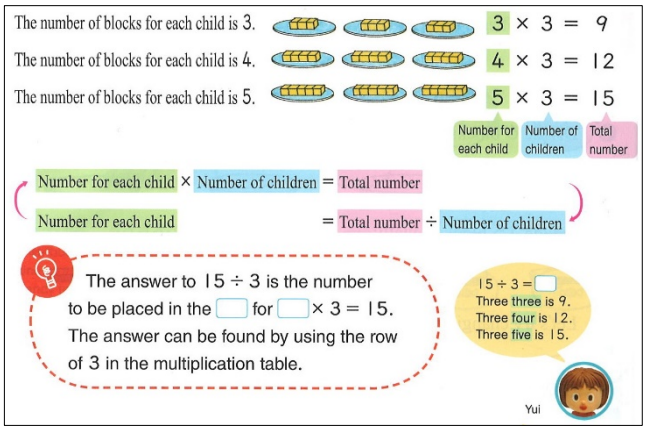


Figure 6. A way of calculation for partitive division (Hitomatsu & Okada, 2015b, p.40)

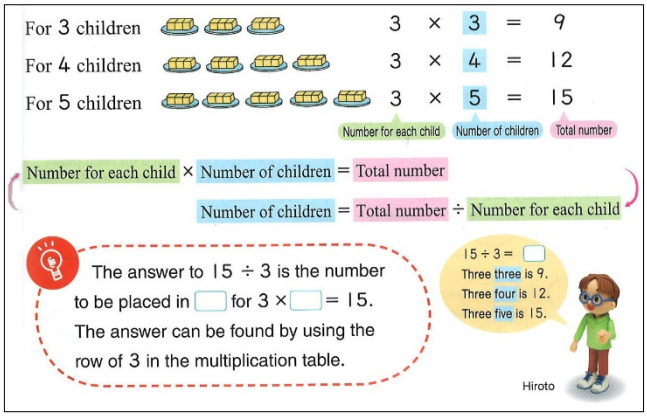


Figure 7. A way of calculation for quotative division (Hitomatsu & Okada, 2015b, p.43)

3) Multiplication of decimal numbers

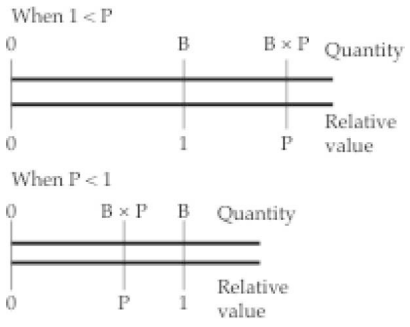
Multiplication of decimal numbers can be classified into three types: i) multiplicand is decimal numbers and multiplier is integers, ii) multiplicand is integers and multiplier is decimal numbers, and iii) both multiplicand and multiplier are decimal numbers. According to the current Course of Study, i) is taught in grade 4 and, ii) & iii) are taught in grade 5. MEXT (2008) explains regarding i) as follows. (MEXT 2008, p.122; Isoda 2010, p.215):

> Students are expected to understand the meaning of multiplication and division of decimal numbers where the multiplier or divisor is a whole number. Multiplication is used when the amount corresponding to a unit is known and the total amount for a certain number of units has to be found. That is, multiplication can be thought of as adding the same number several

times. For example, 0.1 × 3 has the meaning 0.1 + 0.1 + 0.1. Multiplication can be used as a simple representation of repeated addition. Multiplication can also be thought of as a calculation for finding the quantity corresponding to so many times as much as the base quantity.

As for ii) and iii), the meaning of multiplication is explained as follows (MEXT 2008, p.144; Isoda 2010, p.249):

… the meaning of the multiplication of integers and decimal numbers is represented as B × P = A, where B is the base quantity, P is the relative value, and A is the corresponding quantity that has the specified relative size with respect to B.
The fact that the product becomes smaller than the multiplicand B when the multiplier P is smaller than 1, can be explained u sing a number line.



First of all, as for the difference between i) and ii), i) can be represented as (decimal numbers) × (integers), and ii) as (integers) × (decimal numbers). Such distinction is brought by the order of (multiplicand) × (multiplier). As shown in the Guide, while (decimal numbers) × (integers) can be interpreted as repeated addition, in (integers) × (decimal numbers), it is impossible to add a certain integer repeatedly, and neither in case of (decimal numbers) × (decimal numbers). Then, it is necessary to extend the meaning of multiplication to the multiplication as rate. The multiplication whose meaning is extended can be expressed by (base quantity) × (relative value) = (corresponding quantity) and explained with diagram shown in the Guide.

In textbook, situations for (integers) × (integers), which have been already learned are shown, and then, situation for (integers) × (decimal numbers) is introduced. In the problem shown in **Figure 8**, it is intended to think meaning of multiplication: 80 × 2.4, which is located between 80 × 2 and 80 × 3. In fact, this type of diagram is used even for situations (integers) × (integers) and (integers) × (decimal numbers), in this sense, the meaning of multiplication is extended before introducing (integers) × (decimal numbers).

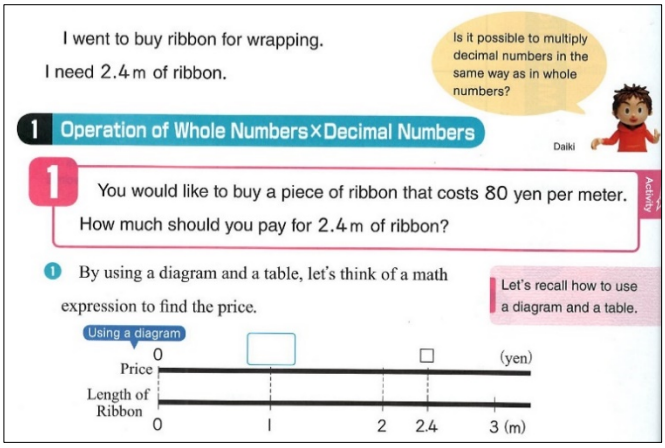


Figure 8. Introduction of multiplication of decimal numbers using diagram (Hitomatsu & Okada, 2015c, p.50)

In this way, it is necessary to distinguish between multiplication before (decimal numbers) × (integers), which can be explained by repeated addition, and multiplication after (integers) × (decimal numbers), which needs to be captured as rate. It is important to adhere to the order of

factors in multiplication even this learning stage, so as to extend the meaning of multiplication without any confusion, by identifying which one is the multiplicand or the multiplier.

Discussion

So far, picking up some subject contents related to the order of factors in multiplication, I analyzed how the teaching with emphasis on the order can be related to these contents. In each content; 1) Construction of multiplication tables, 2) Meanings and ways of division, and 3) Multiplication of decimal numbers, it was clarified that these contents can be explained or be easier to explain by defining multiplicand as number for one unit and multiplier as so many units with the agreed order of factors (multiplicand) × (multiplier).

In this section, I discuss the order of factors in multiplication and the related subject contents from viewpoints of Japanese context. 1) and 2) are about Japanese language cultural context, and 3) is about context of Japanese elementary school mathematics.

1) Regarding word order in Japanese

As mentioned above, the order of (multiplicand) × (multiplier) comes from the Japanese word order. For example, 3 × 5 is expressed in Japanese words such as "3 *no* 5 *kobun*" or "3 *no* 5 *bai*". An operator symbol (×) itself is read "*kakeru*", base form of verb which means "multiply", which expresses action of operation. In Japanese, all of four operations, each one is read according to the order of (operand)→(operator), such as (augend)→(addend), putting into an operator symbol between them, which is read by base form of verb which expresses action of operation. Multiplication is no exception.

On the other hand, 5 × 3 in Western languages, which is equivalent to 3 × 5 in Japanese, is expressed in their words for example, "5 times 3" in English, "5 veces 3" in Spanish. It can be thought that the order of factors comes from their word order. In the case of English, an operator symbol is also read "times" in general. In four operations, only multiplication has the order of (operator)→(operand). If multiplication is expressed "3 multiplied by 5", like "3 divided by 5" in division, the order can be (operand)→(operator) as others, but it seems that use of "times" makes it difficult.

Anyway, in Japan, the order of (multiplicand) × (multiplier) corresponds not only to the Japanese word order, but also to the order of (operand)→(operator), which is adopted in the other four operations. This could be clarified by comparing with other languages. It can be said that the consistency in every order strengthens the order of (multiplicand) × (multiplier).

2) Regarding Japanese vocabulary equivalent to 'times' in English

There are two Japanese words which can be equivalent to "times" in English, one is "*kai*" and the other is "*bai*". For example, in both cases "I have been to Thailand 3 times (*kai*)" and "A is three times (*bai*) as high as B", different words are used. This trivial difference makes a big difference in context of multiplication in elementary school mathematics.

In Japan, times (*kai*) is used to express so many units. This is an expression based on repeated addition or times of integers. On the other hand, times (*bai*) is a multiple representation that can be used also after extending meaning of multiplication as rate. In case of English, for both cases they use the same word "times", so distinction between them can be unclear. In Japan, the transition from times (*kai*) to times (*bai*) also is done on language, so the need to extend the meaning of multiplication stands out. That is why the agreed order of (multiplicand) ×

(multiplier) is needed more. There seems to be such a language difference in the background of the order of factors in multiplication.

3) Regarding distinction between 'expressions' and 'calculation'

In Japanese elementary school mathematics, "expression" is emphasized, and it is often treated distinctly from "calculation". "Expression" indicates to pose operation to carry out calculation in word problems, etc. In the example above "There are 5 dishes. There are 3 apples on each dish. How many apples are there?" to write until "3 × 5" is the process of "expression", and make "= 15" is the process of "calculation". Furthermore, for "15 apples", result of calculation with a unit or a counter, they say "answer".

The order of (multiplicand) × (multiplier) is agreed in "expression", but in the process of "calculation", commutative property is applied and the order of factor is not a matter. For example, in calculating 8 × 5, if students do not remember the table of 8, they can calculate by using the table of 5. In case of division, 12 ÷ 3 (partitive division) can be thought by using multiplication □ × 3 = 12, but of course they can calculate by using the table of 3 based on commutative property. Furthermore, in multiplication of two-digit-number 23 × 4, it can be separated into 20 × 4 and 3 × 4 to construct algorithm, where 23 is written above and 4 is written below, but in fact it is natural to carry out calculation with 4 × 3 and 4 × 2 (20) by commutative property. It is obviously inefficient to carry out calculation of multiplication and division if use of commutative property is not permitted.

In this way, while use of commutative property is permitted in the process of "calculation", the order of (multiplicand) × (multiplier) is emphasized in "expression". It is realized by separating "expression" from "calculation".

Conclusion

The purpose of this paper was to clarify necessity to emphasize the order of factors in multiplication in Japanese context by analyzing subject contents related to this order from a perspective of curriculum sequence. To realize the purpose, picking up some subject contents related to the order of factors in multiplication; 1) Construction of multiplication tables, 2) Meanings and ways of division, and 3) Multiplication of decimal numbers, I analyzed how the teaching with emphasis on the order can be related to these contents.

In each content, it was clarified that these contents can be explained or be easier to explain by defining multiplicand as number for one unit and multiplier as so many units and with the agreed order of factors (multiplicand) × (multiplier); 1) To construct multiplication tables so that it is easier to memorize and without contradiction between meaning of multiplication and the order of factors, 2) To clarify the distinction between two meanings of division (quotative and partitive division), but on the other hand, to unify ways of calculation into multiplication, and 3) To extend the meaning of multiplication to multiplication as "rate" without confusion when teaching multiplication of decimal numbers. It can be concluded that it is necessary to teach multiplication emphasizing its order of factors in relation to these contents.

In addition, some Japanese contexts in which teachers adhere the order of factors in multiplication were discussed: Firstly, regarding word order in Japanese language, the order of (multiplicand) × (multiplier) corresponds the order adopted in other operations as well as the Japanese word order. Secondly, for the English word "times", there are two Japanese words; *kai* and *bai*, and this distinction can bring the need to extend the meaning of multiplications, where the agreed order of factors is necessary to explain the multiplication of decimal numbers. And finally, as for the distinction between "expression" and "calculation", while the order of

(multiplicand) × (multiplier) is agreed in “expression”, in the process of “calculation”, commutative property is applied and the order of factor is not necessarily adhered. Separating "expression" from "calculation" is a key to maintain the agreed order of factors in multiplication.

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Researchers' Eyes of Seeing A Lesson: As the First Work of the Cross-Cultural Study on Lesson Study between Japan And Thailand

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Abstract
In this research, we attempt to describe researchers' eyes when they, we ourselves, see a lesson, as the first work of the project of cross-cultural study on lesson study between Japan and Thailand. 'Lesson study' is talked all over the world today. However, is the meaning of this term same completely, like as 'lesson study', '授業研究', and 'การศึกษาชั้นเรียน'? Our initial research concern is in this point. In this research, it is the purpose not to compare researchers' ways of seeing a lesson, rather to highlight the features of each way.
For this, we observe the video lesson of another country and make comment reports on it in each. These reports are the resource data for analysis. In analyzing, it is required meta theory for descriptions. In this study, we describe the researchers ways of seeing a lesson using the Anthropological Theory of the Didactic, especially the notion of praxeology. It was introduced as an essential means of analyzing human activity in the research context of *French Didactiques*.
As result in brief, researchers' comments in both countries focus on mathematical organization (a collection of mathematical praxeologies) of the lesson likewise. On the other hand, there are some different aspects in those comments on didactic organization (a collection of didactic praxeologies) among researchers in both countries.

Keywords: *ATD, cross-cultural study, lesson study, mathematics education*

Introduction

This research is the first work of the project: cross-cultural study on lesson study in mathematics between Japan and Thailand (Mizoguchi et al. 2015). In this research, we attempt to describe researchers' eyes when they, *we ourselves*, see a lesson. 'Lesson study' is talked all over the world today. However, is the meaning of this terminology same completely, like as 'lesson study' *in English*, '授業研究' *in Japanese*, and 'การศึกษาชั้นเรียน' *in Thai*? Our initial research concern is in this point. In this research, it is the purpose not to compare researchers' ways of seeing a lesson, rather to highlight the features of each way.
For this, we observe the video lesson of another country and make comment reports on it in each. These reports are the resource data for analysis. In analysing, it is required meta-theory

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for descriptions. In this study, we describe the researchers ways of seeing a lesson using the *Anthropological Theory of the Didactic* [ATD], especially the notion of *praxeology*. It was introduced as an essential means of analysing human activity in the research context of French *Didactique des Mathématiques*.

There are excellent precedents such as Miyakawa & Winsløw (2013) and Rasmussen (2016) which study the lesson study itself using the same theory. Although there is no doubt that these are suggestive to this research, none have been compared and contrasted the lesson studies in different countries or cultures yet. This research focuses exactly on this point.

The notion of praxeology in the anthropological theory of the didactic

Didactic transposition and the notion of institution

Mathematical contents or knowledge taught at school is obviously brought into school mathematics (educational curriculum) according to social needs. In other words, the knowledge to be taught at the school needs to be transposed the knowledge which have not made necessarily for school education into the knowledge which could be reconstructed at the school. In ATD (cf. Chevallard, 2016), these processes are called the *didactic transposition* [DT] (Fig.1, cf. Bosch & Gascón, 2006). The process of DT attempts to

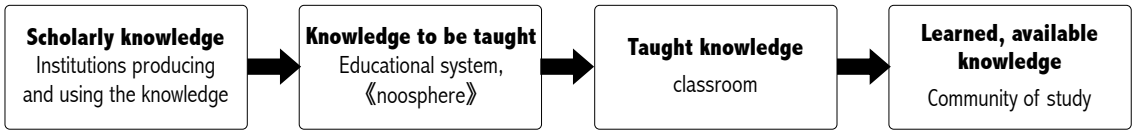

Fig.1 The didactic transposition process

interpret school mathematics suitably, and each origin is in the *institution* which produces mathematical knowledge. "Didactic transposition processes underline the *institutional relativity of knowledge* and situate didactic problems on an institutional level, beyond individual characteristics of the subjects of the considered institutions." (Bosch & Gascón, 2006, p.56) For example, the algebraic formula of quadratic equations is included in Japanese Course of Study, whereas the cubic is not. Why does it not include the algebraic solution of cubic equations, although the quadratic is the knowledge to be taught? That is, there are certain conditions and constraints/restrictions of the institution in deciding as "knowledge to be taught". Also, for the textbook institution, it is not ordinary in current Japanese textbooks of 9th grade to organize the learning trajectory of quadratic equations in relation to the graphs of quadratic functions. Why not? Under these conditions and constraints, the reasons for the existence (*raison d'être*) and the questions for creation of the knowledge could be lost in the transposition process, and as a result, the situation of teaching and learning will tend to *monumentalism*, *i.e.* as if students visit past works guided by their teacher. As the main effect of this long-term tendency, students develop a relation to scholastic knowledge in agreement with the "Recycle bin/Empty recycle bin" principle, *i.e.*, all the knowledge taught may legitimately be forgotten or ignored as soon as they have been passed the exams (Chevallard, 2015, p.176). Even in the classroom institution, a teacher designs a lesson under diverse factors such as actual conditions of students, constraints of educational system, and so on. If the classroom is different, conditions and constraints/restrictions are different, too, and students' learned, available knowledge manifested as a result could also differ. However, it is pointed out that it is not necessarily due to factors in the classroom, but is influenced by "knowledge transposition" at the higher institution. These transposition processes include not only knowledge itself but also its practical aspects such as the path to knowledge (how to learn) and utilizing knowledge (how to use).

The theory of praxeologies and scale of levels of determination

The theory of praxeologies is also a sub-theory of ATD. It was introduced as an essential

means of analysing human activity which could be mathematical or otherwise. How could it be described different "mathematics" in various institutions, *i.e.*, the institutional *ecology* of mathematical knowledge, as mentioned above? In ATD, it is described mathematical activity as *mathematical praxeology* from the point that mathematical activity should be interpreted as a part of human activity. Also, human activities in different institutions to organize mathematical praxeology are called as *didactic praxeology*.

A praxeology ($\wp$) is constituted in both a practical block or *praxis* denoted by $\Pi = [T / \tau]$ and a theoretical block or *logos* denoted by $\Lambda = [\theta / \Theta]$:

$$\wp = \Pi \square \Lambda = [T / \tau] \square [\theta / \Theta] = [T / \tau / \theta / \Theta].$$

The ordered pair of Π is consisted of a *type of tasks* T and a *technique* τ for performing tasks $t \in T$. The associated pair of Λ is consisted of a *technology* θ which explains or justifies Π and a *theory* Θ which justifies θ (cf. Chevallard, 2016).

Praxeologies in different institutions are required the levels of description as a matter of course. In ATD, the scale of levels of determination for describing praxeologies is set as shown in Fig.2. It may help researchers to identify conditions that go beyond the narrow space of the classroom and the subject that has to be studied in it (Bosch & Gascón, 2006, p.61).

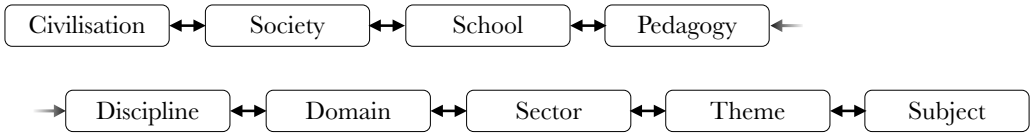

Fig.2 Scale of levels of determination

Mathematics teaching and learning situations are characterised by the construction and sharing of practice and knowledge of a mathematical kind (Miyakawa & Winsløw, 2013. p.188). They are corresponding to praxis and logos respectively. The organization of mathematical praxeologies is called a *mathematical organization* [MO]. On the other hand, a teacher designs the teaching and learning of MO as didactic praxeologies. Such a organization of didactic praxeologies is called a *didactic organization* [DO]. It can be said that the scale of levels of determination attempts to clarify what conditions and constraints/restrictions exist in mutual decision between MO and DO in a lesson, which cannot be reduced to those immediately which teacher and students confront in the classroom.

Data collection: Procedure

Descriptions of lessons and teachers of both countries

The first work of the project is that researchers from both countries see the lesson (DVD video with its English script) of the partner country and make the comment reports respectively. This is intended to make clear what kind of perspective the researchers of both countries tend to comprehend a lesson. Here, the lessons of both countries do not need to be the same grade, contents, and so on. The aim of this work is not to compare viewpoints toward similar lessons but to characterize how researchers understand a lesson. However, researchers in both countries saw the lesson each other without knowing about the teacher's profile.

The Japanese lesson was related to the expansion of algebraic expression in grade 9. The teacher is over 10 years in career, and is in charge of this class ordinary. The lesson was implemented in about 50 minutes that is a regular lesson time in Japan, not specially designed but one of the daily lessons. The number of students in the classroom is standard in Japan, and the style of the lesson is not special.

The Thai lesson was related to addition by carrying digits in grade 1. The teacher is a student intern who works with an in-service teacher. The lesson was implemented in about 50 minutes. Although the video lesson which Japanese researchers saw was around 70 minutes, it included time that is not "lesson". However, Japanese researchers didn't know that. A regular lesson time in Thailand is about 40-60 minutes. This is a daily lesson. The style of the lesson is special for Thailand. Such efforts to improve lessons have been incorporated as part of project by Center for Research in Mathematics Education, Khon Kaen University (cf. Inprasitha, 2012). The number of students in the classroom is less than standard in Thailand, the standard is about 30-40 students.

Making comment reports

Japanese researchers saw the lesson and made their reports individually. Therefore, there are 4 reports. On the other hand, although Thai researchers also saw the lesson individually, they discussed it among members and made one report. For this reason, Japanese reports reflect personal views of each researcher, meanwhile Thai report is comprehensive of all researchers' thought. The format of report was not set specific items but described freely in each.

Researchers' ways of seeing a lesson: Data descriptions

Japanese researchers' comments for Thai lesson

All Japanese researchers [JR_n] point out at first concerning 'Subject' (as the scale of levels of determination) of Thai lesson.

JR_1: (a) The problem situation is similar to the addition by carrying digits of Japan.

(b) The teacher made to share the difference between the problem of this lesson and previous ones by careful review in a whole class without fail.

(c) At the stage of problem comprehension, students roughly found the answer. It could be seen the teacher's intention to make a focus on the task of the lesson ("Write the number sentence and how to find the answer?"). However, the task could be at high level for first graders.

JR_2: (a) The situation of "addition by carrying digits". The problem is seemed to be "how many children by putting together with 9 children playing in the sandbox and 4 children playing on the slider". Although this word problem means to put together, there is also the diagram on the blackboard in the scene of students' presentations at the latter half of the lesson, which means to increase.

(b) Various representations such as picture, block diagram, place value chart, expressions, words, etc. are used. From a picture of children playing, the teacher abstracted a figure aligned with 9 and 4 children. Also, the block diagrams were arranged vertically and horizontally. The teacher made students manipulate them actually.

(c) In this lesson, it is seemed that the teacher focused that students could notice 9 and 4 by grasping the problem with the picture (including the teaching on the number of set that children with different colored T-shirts are regarded as the same) and pay attention to making ten rather than counting.

JR_3: (a) The problem situation of "putting together" was that there are 9 children playing in the sandbox and 4 children playing on the slider. When the teacher represented "to put together" by her hand movements, she made to bring close to each hand from left and right, and butt together her both fingers. At this time, students just saw and heard teacher's explanation.

(b) The problem situation of "increasing" was that 4 children came to where 6 children were playing in the sandbox. She used the arrow (←) to show that they came to the sandbox, and when representing "increasing" by hand movements, she made to fit her palms by approaching her hands from both sides. At this time, students also represented "increasing" by their hands like as her.

(c) Since the students imitated the movements of the teacher's hands in this way, it seems that influence of the teacher's teaching could be strong in this classroom.

JR_4: (a) Students have already learnt two meanings (increasing and putting together) of addition in one digit numbers. This lesson aims to learn adding by carrying digits using these meanings.

(b) The problem of this lesson was to think about how to find the answer with an expression (Task: Write the number sentence and how to find the answer?) after sharing that the answer was 13 (ascertaining by counting) when there were 9 children and 4 more increasing.

(c) It seems to be a good way of questioning because it could conform to the mathematical content for asking the method of calculation itself (also possible to answer by counting). On the other hand, it is doubtful whether the teacher thought about the numerical setting of 9+4 being suitable for the purpose of the lesson. If it was under consideration, why did the teacher do so?

(d) Although the aim in terms of knowledge was relatively clear, it could not be understood enough about what kind of ability each student was developed through the lesson, while there might be constraints of the content.

All researchers mention the ecology of mathematical knowledge on Subject level of determination. That is, they identify the addition by carrying digits as aimed knowledge of this lesson. There are many points of view on how one lesson is related to other lessons (*ex.* JR_1(b), JR_3(c)). Especially, JR_3(c) refers to the influence from the higher levels of determination. Also, JR_1 describes as the following JR_1(d) at the end of the report:

JR_1: (d) For whether or not students could think of "making 10" learned in 9+4 into the other problem situations in the same way, students only said in unison "making 10" without solving a so-called evaluation problem in this lesson.

In addition, JR_2(a), JR_3(b), and JR_4(a) are comments on how "increasing" and "putting together" learned in the previous lessons could be related to this lesson. In particular, JR_3 also describes as following JR_3(d) at the end of the report:

JR_3: (d) I looked at the hand movements of "increasing" and "putting together". When the teacher explained "increasing" and "putting together" at the beginning of the lesson, her movements of the hands were different. However, while explaining the summand decomposition with moving blocks for the problem of this lesson, there was a discrepancy between the movement of blocks and of hands. I think that it is better to unify the operation of blocks as semi-concrete objects and the movement of hands for understanding of addition.

Thai lesson has proceeded to the group activities afterwards. JRs comment from didactic point of view about this as follows.

JR_1: (e) The intent of group activities is not necessarily clear.

(f) The way to do group activities was to use a set of color pens on one worksheet for each group. By doing so, filling out the worksheet produced a situation that someone in the group.

(g) The role of the teacher in the group activity is unknown (at least from the video). In the case of Japanese lessons, teachers do not stay in one place for a long time in assisting individually (even in group activities). What is Thai perspective of group activities and how to use it in the ordinary lesson actually?

JR_2: (d) On the worksheet used in the group activities, there was a column for writing an expression (probably), and the students wrote it at a relatively early period (they thought of diagram or explanation after writing it). However, the expression was not quite taken up by the teacher in a whole class discussion. Teacher organized the interaction focused on the method of addend decomposition and making 10 using a picture and blocks.

(e) Perhaps the teacher intended to discuss about the expression at the end of the lesson. If so, why?

JR_4: (e) Even though it was shared to some extent by students that a method was a question of the lesson, it is seemed that they didn't understand enough to pursue what kind of a method in a contract with their teacher. It is evident that students have not sufficiently considered a method for a long time in the group activities. For this reason, the teacher did a strong instruction, otherwise it seems that the students could not solve it. However, it seems that it was quite early in the 1st grade, so it was inevitable even if the contract could not be made (as instructed to prepare for presentation).

At the end of Thai lesson, the stage of so-called '*neriage*', *i.e.*, the phase of *refining and elaborating* (cf. Mizoguchi, 2013), was set. JRs also comments on that as follows.

JR_1: (h) Although it is the same for all the phases of the lesson, it took a lot of time especially for the phase of *neriage*. However, it seems to be very well done in terms of achieving the task although it is too polite.

JR_4: (f) It seems to be well done that 3 groups presented and shared each other solution. However, it also seems that it reached only the level of sharing. This is because all groups presented the same method, on the other hand, it could be inevitable since the numerical setting is 9+4. Unless something unusual, it was supposed that students decomposed 4, and it was done so actually. In addition, since the teacher didn't ask further questions, this could be her intention. Therefore, this lesson could not increase students' ability through sharing and discussing the solution.

(g) I was worried a lot about how to use time of the lesson. It seems that time is considerably allocated to something not related to mathematical content.

Thai researchers' comments for Japanese lesson

Thai researchers [TRs] made one report through discussing among members. For this reason, it is well organised according to the sequences of the lesson. It consists of the following three sections:

1. Review what they learnt in the last period. (5 minutes)
2. Teacher give some questions or tasks, students solve the problem. (25 minutes)
3. Teachers discuss how to solve/find the answer and computing processes from students' ideas. (20 minutes)

The feature of descriptions is to carefully follow the "facts" of the lesson.
In section 1, there are the following comments.

TRs(a): Classroom starts from review what students learnt the topic of expansion in the last period. Teacher asks "what is expansion?" and students answer about the expansion that using distributive law.

TRs(b): And this period is about the more deeply expansion. Classroom still runs to teach and lets student explain their ideas from figure, students answer the question directly. Then,

the teacher talks about the equation with brackets. How do students begin the process? and equations with multiple brackets what they do? How to calculate starting from the equation with brackets to no bracket.

In section 2, there are the following comments.

TRs(c): During students solve the problem, teacher observes classroom and stimulates students. There are interactions between teacher and students all time.

TRs(d): From the content, it's dimension. Teacher lets the student do the activity. Students represent with figure. "You explain equation as figure." Teacher always motivates students by questions and walk to observe students' worksheet. Teacher stimulates students to talk about how they think such as "Oh, how do you write figure? An example from students' answers such as there are 4 multiplier, so figure is 4th dimension." They try to find the relationship with multiplication with four dimensions and on-going question. And the highlight question is "from the figure you drew can you calculate it?" and "how do you calculate?"

Also, in section 3, there are the following comments.

TRs(e): Teacher explains how to find the answer from students' ideas and how to compute. In that time students say "Eh, it is easy to calculate. You multiply $(p+q)$ by answer of (1) [*note*: (1) is the item number in the lesson]" is the first sentence to raise issue to find the solution from separate into 8 sections. Teacher hints how to do next: "You think there are how many sections after expansion and combination. This helps your idea. You can't write figure if you are particular in dimension." Students calculate with distributive law such as $a(x+y)+b(x+y)$ are $ax+ay+bx+by$.

TRs(f): On the process of teaching, students and teacher are discussing how to find. It's clue to find from teacher: "It is important that what tie a line to. This is clue when you calculate." And the highlight sentence from students' ideas in this period after teacher asking is "You explain but it is different from everyone." Students present their idea like that "This equation is only addition $(p+q)$. From there, it is same as (1). So, I use (1) equation. Then, (1) is $a(x+y)$, and answer is $ax+ay$. It is hard to explain. I said appearances is important, I remake equation, $MN(p+q)$. Then I multiplied $(p+q)$ by (1)," From this problem, teacher says; If students find how many sections first, they can calculate actually and cannot to find the final answer if they already know 8 sections after expanding, they will realize their mistake that there aren't 8 sections. On the other hand, if sections are 9, they will realize their mistake.

TRs(g): Until the last discussion "How do you express this 16 sections as figure?" and some student explains this with tree diagram. So, teacher keeps idea to discuss: "It is a little hard, but is it easy to understand?" and the last, teacher points out how students think if they use combination to calculate quickly, and they get clue how many sections are appeared and can find final expanded sections when they see number in brackets.

TRs' comments are records with carefully tracking the teaching and learning process of mathematical knowledge which is the Subject of the lesson, with the utterances/interactions of the teacher and the students. It can be said that this is the *TRs' eye*.

Characterising researchers' eyes in terms of the notion of praxeology: Data analysis

TRs' eye corresponds to praxis, JRs' eyes also correspond to logos

All descriptions of TRs carefully track observable facts. In other words, they attempt to understand the activities/interactions of teacher and students in the lesson by practical block/*praxis* which consists of *type of tasks* and *technique*, therefore it is constituted partial

descriptions of mathematical praxeologies. The same thing can be said of the teacher's didactic praxeologies. For the didactic praxeology, although the didactic practice can be observed generally, the corresponding didactic *technology* and *theory*, *i.e.*, theoretical block/*logos*, are unobservable. The teacher normally neither explains nor justifies his/her practice in the classroom. These can be confirmed by some procedures such as interviewing directly with the teacher. Therefore, it is pointed out that the descriptions of TRs are extremely reasonable in terms of understanding the lesson.

On the other hand, the descriptions of JRs are more focused on the mathematical knowledge which is the Subject in the lesson, rather than the lesson itself. It can be pointed out that they attempt to describe students' activities not only in praxis but also in logos (however, only *technology* here). JR_3 notices technology in mathematical praxeology related to this lesson such as "increasing" and "putting together" with hand movements (all descriptions of JR_3). By paying attention to the numerical value setting of "9+4", JR_4 focuses on *technology* related to addend and summand decompositions (*techniques*) (JR_4(c, f, g)). Furthermore, JR_1 is interested in a *technology* of didactic praxeology such as whether making 10 learned at "9+4" is available or not for other problem solving (JR_1(d)), JR_2 also have an interest in what teacher's didactic praxeology was in terms of the relation between mathematical expression and others (JR_2(d, e)). Thus, it can be characterised that the attentions in the descriptions of JRs are directed not only to praxis but also to logos (including conjecturing) of mathematical and didactic praxeologies.

TRs' and JRs' ways of understanding of MO and DO

As mentioned above, descriptions of TRs are recognised as a MO developed in the classroom with focusing on the progress based on a time series of mathematical praxeologies in terms of teacher's and students' practices. It is a precise comprehension about the birth and the growth of *techniques* for the *type of task*. On the other hand, the descriptions of JRs focus on the influence of *technology* on praxis for a MO in the lesson. In that respect, it does not emphasize the birth and the growth of *techniques* but is conscious of how such *techniques* is justified. Therefore, it can be said that the descriptions of JRs are rather focused on the teacher's didactic praxeologies. Considering that, there could be not anything pursuing the didactic praxeology in the descriptions of TRs.

How can we characterize such an issue as an aspect of lesson study?

Originally, a MO developed in the classroom depends on the DO, and the DO is developed according to comply with certain aims for the MO. That is, this interdependence of DO and MO is described as a co-determination of DO and MO (cf. Miyakawa & Winsløw, 2013, p.188). The MO seen by JRs is exactly described as an interdependent relationship with DO, whereas TRs describe MO independently.

Discrepancy between JRs and TRs from the perspective of the scale of levels of determination

As we have mentioned, JRs consider the mathematical knowledge (as mathematical praxeologies) and the didactic activities (as didactic praxeologies) not only in the lesson itself but also in other lessons (thus, in relation with other mathematical contents). Based on the scale of levels of determination, this is characterised by considering not only on the Subject level where one lesson is targeted but also on other upper levels. On the other hand, it is possible to characterize TRs' as seeing specialized on the Subject level.

Then, what could it cause such discrepancy between JRs and TRs?

JRs more or less implement usually the interventional research practices through the lesson studies in schools. Even in Thailand, researchers are interventional in school efforts in the same way, but the aim is primarily professional development (cf. Inprasitha, 2012). Of course, these situations also exist in Japan. However, the feature of lesson studies in Japan are not just the sharing of the didactic practices, but rather the sharing of the didactic *technologies* and *theories*. In order to make it possible, the lesson study focused only on the

Subject level is inadequate, it is needed to examine the ecology of the related mathematical knowledge and the educational purpose at the upper level, and so on. However, it is not that such a situation does not exist in the lesson studies in Thailand. It should be noted that the above implication could make be possible based on the data collected in this paper. Indeed, this implication does not become aware necessarily even in Japan. It is just asserted that this is the first finding of our project.

Concluding remarks

This research is the first attempt as our project but based on the limited data. It is not a simple comparison between two countries but a way of understanding each other and also ourselves as a cross-cultural study.

The implication obtained in this research could provide a practical suggestion for lesson study. However, it is not our current purpose in itself.

Future issues are remained in order to consider different 'levels of determination' in lesson study such as what kind of paradidactic infrastructure (paradidactic praxeology) (*eg*. Miyakawa & Winsløw, 2013; Rasmussen, 2016) is studied, what is effective and what is not, for whom it is, and so on.

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CER: An Enabler for Multi-grade Classroom as a Sustainable Learning Environment

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Abstract

The aim of this paper is to argue a case for the use CER as an enabler for multi-grade classroom as a sustainable learning environment. Multi-grade classrooms are mostly found in far-flung rural areas, which are poverty-stricken and do not have a socio-economic muscle. Multi-grade teaching is viewed in a deficit mentality and social injustice, marginalisation, and oppression are normalised in these classrooms. Critical Emancipatory Research (CER) aims to emancipate the marginalised and oppressed rural multi-grade communities. CER has three phases interpretive, analytical, and educative, which were followed in allowing multi-grade teachers to actively participate in challenging the status quo. They critically challenged issues of power in the classroom teaching system in an emancipatory manner. Multi-grade teachers apply newly gained knowledge to create an inviting classroom atmosphere, coming up with new and creative ideas and activities. Newly gained knowledge enables multi grade teachers to challenge the classroom oppression and marginalisation and not only its symptoms.

Keywords: *CER, Multi-grade Classroom, Sustainable Learning Environment*

Introduction

The case for CER for in this paper was influenced by the realisation that domination and oppression are engrained in the traditional educational system, through which a culture of silence is created by eliminating the paths of thought that lead to a language of critique (Nkoane, 2009:21). Chetty (2010:np) opines that discursive practices in multi-grade classrooms are informed by educational practices which prescribe what is selected and excluded to form discourse. Foucalt's interpretation of the term discourse resonates with how hegemony dominates the multi-grade classroom.

For this trend to be arrested, Little (2005:2) notes that there should be a shift on philosophies of learning from ones premised on the emphasis of learner homogeneity and the standardisation of teacher inputs to one that acknowledges learners and the need for differentiation in the contributions from teachers.

Literature review

CER presents a different way of looking and dealing with multigrade teaching and learning and contributes to the paper by addressing the questions 'why' and 'how'. Looking at these two questions sets the scope of relevant data by focusing on a specific viewpoint. With regard to this study the questions 'why' and 'how' refer to: 'why' it is important to have a sustainable multigrade classroom and 'how' we are going to make a sustainable multigrade classroom possible. For us to answer these questions we looked at a framework that promotes collaboration between myself and multigrade communities, with the aim of bringing about transformation in that situation (Merrian & Ntsane, 2008:184). CER directed the study towards emancipatory, transformational, and empowering praxis that talks to the collaborative achievement of the aim and objectives of the study (Mahlomaholo &

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Netshandama, 2011:225). Importantly, this should be a framework that seeks to convert the marginalised multigrade teaching communities into becoming equal partners, where their discourse is brought to the centre and their views are heard, acknowledged, and respected. Lastly, that framework should be the one that affords the marginalised an opportunity to actively engage in the processes meant to change their multigrade situation for the better (Dold & Chapman, 2011:512).

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But above all, I maintain that CER is useful in assisting us all to respond to the challenges of our lives and it is, at the same time, methodologically consistent with humanistic values which are crucial now more than ever (Piper, Piper & Mahlomaholo, 2009:13). The overall aim of using CER was to formulate socially inclusive multigrade learning communities through respect, empowerment and hope.

Using CER in critical ethnography based study empowers people through a discursive process of gradual enlightenment, which has the potential to lead to communities of practice through engagement (Schwarz, 2006:281). Wenger (2006:29) summarises it correctly: the more diverse the consortium in a community of practice the more productive they become. This is more achievable if they engage in a dialogue in which they share a common goal and each of them is free to express his/her desires, emotions, intentions and awareness in a way that individuals who are not part of the group would be able to access (Watson, 2012:1).

CER's focus is not on signs but on the root causes of oppression in the multigrade classroom as it seeks to identify and challenge it. CER challenges oppressive multigrade education situations by thematising power and gearing itself towards subversion of excesses of that power (Stahl, 2008:4) It helps to raise the awareness and consciousness of the people involved in multigrade teaching and learning. For this study, that is imbued with humanistic values, respect for local culture, respect for natural settings, a critical and different look at power and power dynamics, and how these factors play themselves out every day in the multigrade classroom (Rao 2010:9), then CER becomes relevant.

This study challenges the status quo and the generally accepted view that multigrade teaching is of a low standard, unsustainable, unattractive, temporary and poor a cousin of monograde learning (Taole & Mcube, 2012:33).

Multigrade classes are currently part of the discourse on how to obtain both significant growth in enrolment rates and improved educational quality (SDG 4) in far flung rural areas (EFA, 2014:6; UNESCO, 2004:19). This study needed the framework that has as one of its objectives a challenge to that distorted belief about multigrade teaching and learning. Kinsler (2010:175) states that CER's objective is to strategically emancipate research participants from the chains of tradition, precedent, habit and the coercion of dismissing multigrade teaching as temporary and an inconvenience. To be able to do this, this study went into the multigrade environment to gain some understanding of the power relations in practice. CER analyses the hold of ideology over multigrade teachers' meaning construction; thus, there are collaborative actions and interactions all the way (Biesta, 2010:43).

Gaining understanding and active collaboration is a step beyond challenging the status quo and goes to the level of awareness of emancipation and freedom, as co-researchers start to construct their own meaning and understanding of their world. In the process of the study, co-researchers challenged tradition, precedent, and habit in multigrade teaching and learning as a way of giving their own meaning to their situation. Challenging the multigrade teaching's imaginary chains of tradition, precedent, habit, and coercion is the first step towards emancipation.

Emanating from CER, this study aimed to promote the agenda of social justice, so that co-researchers were treated as equals and were given much-needed respect. This is supported by Mahlomaholo (2009:225-226) and Stahl (2008:4) as they state that the promotion of social-justice should lead to a change in the status quo and overcome injustice. CER posits that the hold of ideology can never be complete; thus, the possibility for transformation and change in meaning construction for the multigrade teaching and learning community exists.

Overcoming the hold of ideology extends to the search for equity, peace, freedom, and hope in multigrade classrooms. For this study, social justice will be realised when multigrade communities are treated with dignity and equitably, and exposed to peace, freedom, and hope (Glesne & Pushkin, 1992:7). From this standpoint, and with CER being the lens of choice in the study, it fitted well into the development of a framework for a sustainable foundation phase multigrade classroom.

Empowerment of multigrade communities is one of the objectives of CER and in this study is done with the acknowledgement that education is neither objective nor politically neutral (Mahlomaholo, 2012:9). It is my assertion that humanistic values, such as emancipation, empowerment, and conscientisation are central to the development of a sustainable multigrade foundation phase classroom as it can only be fully achieved through the empowerment and cooperation of all participants involved in the study.

This study, as CER posits, focused on the co-researchers as the 'speaking persons' who should be respected and acknowledged, and not be treated like quantifiable objects in the science laboratory (Chetty, 2010:np). Based on the abovementioned point, this study focused on the co-researchers as the speaking persons capable of constructing their own meanings and who cannot be adequately defined and described from the outside. For them to be

empowered, participants in this study had the opportunity and power to make their own meanings, and to inform and direct the study (Mahlomaholo & Nkoane, 2011:43; Mahlomaholo & Netshandama, 2012:33;

As speaking beings, there was always the possibility of actions and reactions as people interpret and reinterpret their environment. This was from the co-researchers' perspective as they informed the process and determined its direction and way forward. They could freely agree or choose to disagree with any component of the study and at any time, as informed by the principle of freedom of expression and association.

Research Design

In conducting CER, there are three main steps to be observed and followed: the interpretive, the analytical and the educative (Tracey & Morrow, 2012:112). These steps help to strategise the research process so that there is better organisation and flow of information. In the first stage of the study, which is interpretive, multigrade teachers were encouraged to evaluate their daily experiences, their truth, and their reality; all the information that they have taken for granted of how multigrade teaching and learning is manifested. This critical reflection on their situation had the potential for change, social awareness and engagement. Multigrade teachers' unique voices were heard as they were in charge of their interpretation. Their meaning-making and interpretation was important at this stage, as the study relied on them for their lived experiences, interpretation, and interests (Denscombe, 2003:267).

The next stage was the critical analytical phase, which encouraged the multigrade teachers to critically examine social issues, which are generated by reading the text at hand (Malebese, 2016:30). At this stage the focus shifted to the essence of the problem and the co-researchers were brought to the centre as their voices carried important indigenous meanings and experiences.

The main aim of this phase was to assist multigrade teachers to interact with their personal, affective investment in textual reception, so that they could relate and make sense of the matter of textual production structure. Beyond this, the team concentrated on the multigrade teachers' interests, ideologies, power and legitimacy at play in their classrooms and school generally (Fine, 2000:17). Importantly, attention was given to the underlying meanings given by my co-researchers as they emerged from the information analysis (Denscombe, 2003:267).

The third and last step was the educative phase and here the team made a conscious decision to deliberately intervene, in order to deal with all situations and circumstances perpetuating the marginalised and disempowering atmosphere, whilst on the other hand, offering workable alternatives (Denzin & Lincoln, 2011:ix-xvi). This process encouraged all participants to actively and creatively work towards constructive actions to address social realities discussed both in and outside the classroom through various modalities. We looked at the information from the previous phase (analytical) to make full sense of our findings in order to formulate a sustainable multigrade classroom.

This assisted all stakeholders to become empowered, to work towards emancipation, and become aware that their discourse occupied centre stage through the knowledge and skills gained in the development of the framework. It was important to go through all the stages with all the co-researchers in order to implement the buy-in and ownership of the framework (Tracey & Morrow, 2012:85). CER directed this study to investigate issues of power and its dynamics within the multigrade school situation with the focus on oppression from power

dynamics in its different forms. This is so as some multigrade communities have internalised their oppressive situation to a level where they believe it is normal; one of CER's objectives is to challenge that belief and demystify the myth.

There are two answers to this question; one is that reality should be approached objectively as an external reality 'out there' requiring the researcher to maintain a detached and aloof position when studying it (Mathobela, 2105:45).

Another option of answering this question is that there is 'no truth' out there and that reality is subjective and can be constructed only through the empathetic understanding of the research participants' meaning of their world. The second option is suited to this study, as different perspectives on what is real were determined by the diverse values and lived experiences of the co-researchers (Mertens & Wilson, 2012:172).

Multigrade communities in this study were guided by their own conscious and lived experiences as opposed to the positivist version of viewing reality as objective and external to human beings. It allows multiple voices to be heard and respected as co-researchers had undergone a variety of different socially constructed experiences.

CER acknowledges that there is diversity and based on this, there is a plethora of realities and multiple truths. Thus, to CER practitioners this is more of an asset than a liability. They believe that human beings are never neutral and there is no absolute truth. The nature of reality for multigrade teachers is socially constructed, through social interaction and this has shaped their knowledge and the way they view their world (Barry, 2012:428).

The role of the researcher (me), in the study was mainly to provide a platform from which the multigrade teaching community could come together to seek a solution to a specific problem collaboratively. Participating actively and collaboratively meant that all community members were treated as equals and were respected and acknowledged. This collaborative team drew strength from active collaboration. As the important instrument in this exercise, I was careful not to dominate and/or suppress dissenting views as we viewed our diversity as a strength rather than a liability (Makoelle, 2013:15).

I acknowledged that I was interpreting the co-researchers' interpretation as equals and needed to step outside myself and attempt to understand the world of multigrade education as informed by the co-researchers. As the coordinator in this process, I attempted to bring to the centre meanings from the multigrade teachers who were initially marginalised and excluded (Maso, 1995:24). The researcher was deliberately subjective in subverting the excesses of power throughout the process and openly took sides in favour of mutigrade teachers who felt vulnerable and excluded. This was done in an attempt to facilitate a sustainable foundation phase multigrade class.

Findings

The successful implementation of CER is dependent on open and meaningful dialogue between all stakeholders in the team. This meaningful dialogue is premised on active and equal participation of all members in a respectful manner, where everyone's view is acknowledged and valued (Makoelle, 2013:14).

This is so as the aim is to bring the discourse of multigrade teachers to the centre; who else is better suited to talk, discuss, and explain it better than the co-researchers themselves?

Multigrade teachers, as co-researchers and sentient beings are able to represent themselves in language; thus, CER provides a platform for respectful, emancipatory, and empowering language (Wilson, 2012:11). CER uses discursive reflection amongst the researcher and co-researchers as peers who are able to reflect openly and freely on their lived experiences. The type of language used also encourages respect and allows the team to elucidate and where necessary, corroborate information until it is presented in a socially inclusive manner, so that they have the buy-in and ownership thereof (Malebese, 2016:37).

Recommendations

CER encourgaes the relationship between the co-researchers and me was one based on open and free conversation, open discussion, and socially inclusive dialogue. Initially it was about establishing trust and a meaningful relationship of equality among partners trying to find a solution to the common problem. We established a relationship where openness and open-mindedness was foregrounded among members of the team.

This kind of relationship between a researcher and co-researchers ensures that the researcher remains humble. In this study there was spirit of mutual involvement and closeness as opposed to arrogance and aloofness, especially on my part as researcher (Lather, 1986:257; McCarthy, 1984:237). This led to a relationship of trust among the team members and strengthened an open, safe environment for the sharing of ideas amongst members. As a result, there was greater reciprocity and engagement, which meant that the co-researchers were 'speaking persons' free to interpret, reflect and construct their own meanings in a caring, respectful and solicitous environment.

One of the objectives of CER is to improve the quality of peoples' lives by creating a safe environment and a platform for multigrade teachers to express their views and construct their own meanings to direct the study towards a sustainable multigrade classroom. In the process teachers are empowered and foreground their own discourse through the acquisition of knowledge to shape their own futures.

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The Synthesis of Computer Practice Skills Instruction Using Flipped Classroom Techniques

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Abstract

The purpose of this research to synthesize teaching styles, computer skills. Using Flipped Classroom techniques 1) study the principles and theories related to teaching computer skills, 2) study the Flipped Classroom techniques, 3) synthesize the teaching methods of computer skills. Using Flipped Classroom techniques From this concept, the hierarchy of teaching styles can be classified into 5 steps as follows: 1) Analysis and preparation It is the stage where the instructor analyzes the curriculum and plans to prepare the instructional media. And to prepare students to learn on the Internet for students. After that, the teacher instructs the students to perform basic tasks according to the prototypes taught by the teacher. 2) preparation It is a step of preparing the students for an understanding of how to practice. Before practicing. By studying the details. Method of teaching on the Internet. After that, the students took the test after their own lessons. 3) Experimental phase It imitates the work or practice that comes from understanding. 4) Application Create new work It is up to the learner to design new pieces of knowledge learned. And 5) Summarize and report the results. This is the stage for the learner to write a detailed description of the new work.

Keywords: *The practical skills computer instruction, Flipped classroom techniques.*

Introduction/ Problem

In education, learning objectives are brief statements that describe what students will be expected to learn. We have to focus on practical skills. According to Panich (2013), the 21st century to learn mastering skill of learning . It means practicing and doing to acquire the essential skills are life skills and work. Learning and innovation skills and information skills The media and technology are also consistent with Kriengsak Chareonwongsak (2016), who discusses the role of Thai education in the Thailand 4.0. The education must change from just developing the traditional knowledge. To a new education, the teacher must develop the learner's ability to practice. Can even produce knowledge and innovation. The emphasis on learning skills is also reflected in the Core Curriculum for Basic Education (2008) of the Ministry of Education (2009) .Focus on developing human learners who are both physically and physically balanced. Morality and virtue Have basic knowledge and skills. Including the necessary attitudes towards education. Career and Lifelong Education This is in line with the National Education Act BE (1999) the Ministry of Education (2009) in Study Behavior,

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Observation, Learning Behavior Participation in activities and tests in the instructional process as appropriate for each level and educational model. And provide the institution with a variety of ways to allocate opportunities for further study. And the results of the assessment of learners under paragraph one shall be applied for consideration.

Psychomotor skills consist of body movements and coordination of skills. It may be a basic body movement or a process. It is one of the learning behaviors that educators such as Bloom (1961) say are less important than cognitive learning behaviors. And Affective mind-related learning, so that the teaching and learning to improve the skills. It is not only a one-time lecture, but also a general lecture. But there must be a way to get that knowledge to try out, or to practice in situations, too. Kamolwan Tangtananont (2016) says that the development of practical skills requires practice. Teachers need to develop a practical teaching style so that they have the opportunity to practice their skills. To be consistent with the learning in other areas as well, which corresponds to the direction of Tissana Krammanee (2015) . Most of the skills are composed of skills. These skills will develop with good practice. It will be proficient in the use of the body itself.

Flipped classroom is an innovation in teaching and learning. Jonathan Bergmann and Aaron Sams. (2012) have developed the traditional concept of learning at school. Then bring back the work or activities to do at home. But to learn the content at home. Then bring the work or experience that has been learned or done at school. The teacher will introduce and explain the answer. Using Flipped Classroom techniques to teach skills. It will allow the instructor to spend time in class to practice various activities. And reinforce the interaction and understanding of the learner as well as increase the opportunities for participatory learning in various ways. Anuchai Teeraruangchaisri (2016) mentioned the advantages of teaching this model. Students who have basic and slow learning pace are different. You can choose to spend the time to study as appropriate. Repeat or revise as needed. The transition to this technique. It encourages learners to participate in more learning (Active learning) Because the learner learns from the activity, it is important for the learner to think and understand the higher level of thinking in accordance with the Vijarn Panich (2013b). As such It helps to reach out to different learners. Especially students who learn later than others.

Teaching computer skills is problematic in terms of learning time spent by different students. Some people have a good foundation, they can do it quickly, and some people with little foundation can delay it. In addition, the duration of study at the school is limited and there are limited learning materials. The learner cannot memorize the demonstration process while the instructor Teachers need to give a lot of time to demonstrate their individual use. Due to the large number of learners, they cannot cared for and guided the learners thoroughly. The learners cannot combine their skills into complete skills due to their previous experience in both basic computer knowledge and computer skills. Intelligence. In addition, limited time to study, lack of flexibility in study time and time spent learning to walk, changing classrooms, making students with weak or basic knowledge less learning and cannot complete work at times, students who are good at studying lack the opportunity to gain more experience based on the abilities of each student. This results in poor student achievement.

Above The researcher is interested in developing a computer instructional model. Using Flipped Classroom techniques. To create a teaching style that is consistent with 21st-century learning management and in line with the national policy of developing teaching and learning that will enhance learners' ability to match the world in the future.

Literature Review,

Teaching computer courses

In the learning management of core curriculum education. The Ministry of Education (2008) has introduced the core curriculum in core curriculum 2008 in the following areas:

Self-employment By focusing on how to work consistently. Both individual and group work to achieve the goals, including job analysis. Planning work working And evaluation

They also talked about their collaborative skills, concluding that teamwork can work together happily with others. The focus is on learners to work in the process of working and working in groups. By knowing the roles within the group. Have good listening skills Have the virtue of working together, summarizing and presenting the work.

Conclude that the process of computing There are steps in teaching and learning activities as follows: 1. Preparation 2. Prepare 3. Experimental 4. Practical training 5. Application and 6. Summary

The Flipped Classroom techniques.

Krammanee, (2010) states that the classroom is flipped back to the English language. Flipped Classroom is a teaching style in which learners learn from their homework through self-directed learning from the video. Video) outside the classroom or at home. Regular classroom learning is a learning experience that is shared with classmates. The teacher is there to help guide. This method of learning is a return to the original concept of learning the content at school and bring back to work at home. By studying the content at home by yourself and then bring the work or experience to learn more at school together with friends continue to teach the teacher to explain the answer. This format later developed and extended to broad. In particular, the adoption of a variety of ICT media with high potential in the present.

Vijarn Panich. (2013) says that the classroom is the way to go or the flipped classroom is a developed instructional model. The main idea of the model is to plan to take advantage of classroom time and out-of-class time to effectively promote student learning. Use both personal and time resources. The way of the classroom teaching model is reversed. It is an adaptation of the learning activities that students do in class and at home, usually by taking classes and returning home to study or homework at home. By reversing students home and taking homework or classroom activities into class. Home study It occurs through the use of learning media such as videos recorded by teachers.

Design /Procedure

This research. The researcher conducted the research by analyzing the documents.

1) Study principles of teaching computer skills. Using Flipped Classroom techniques.

In the learning management of core curriculum education. The Ministry of Education (2008) has introduced the core curriculum in core curriculum 2008 in the career and technology.

Self-employment by focusing on how to work consistently. Both individual and group work to achieve the goals, including job analysis. Planning work working and evaluation.

They also talked about their collaborative skills, concluding that teamwork can work together happily with others. The focus is on learners to work in the process of working and working in groups by knowing the roles within the group. Have good listening skills Have the virtue of working together, summarizing and presenting the work.

From the curriculum of basic education 2008, the subject matter of vocational education and technology concludes that the work process in the computer course. The steps of teaching activities are as follows: 1. Preparation 2. Preparatory 3. Experimental 4. Practice 5. Application Create new work and 6. Summarize results and report**.**

2) Study the Flipped Classroom techniques process. There are four main steps in the Flipped Classroom techniques There are four steps in the classroom, two at home and two at the school.

What to prepare students when they are at home.

1. "What" is the stage for students to learn from the resources that teachers have prepared such as videos, textbooks, documents as well as sources of knowledge that students find themselves. This is a period of exploration and learning (Concept Exploration)

2. "So What" step is to get students to understand what they learned during "what" and to make sure they know it in ways like self-study. Writing Thinking Reflects Meaning Making

What to do in class **room.**

3. "Now What" is a step for students to bring knowledge. To experiment or apply in various ways according to the activities that the teacher assigns or assigns the knowledge to use. (Demonstration & Application)

4. "Activities What" is the stage for students to apply knowledge to work as a piece of creative work. As teachers have prepared. It is a learning experience. (Experiential Engagement)

From all 4 teaching steps Students will go through various processes ranging from getting the knowledge. Understand the knowledge. Experiment with knowledge (Student-cantered learning). Learning activities that will motivate students to reach their goals.

3) The synthesis of teaching methods, computer skills. core curriculum basic education 2008 in the career and technology curriculum Using Flipped Classroom techniques, proceed as follows by Jonathan Bergmann and Aaron Sams (2012).

4) Presentation of computer skills training curriculum. Core curriculum basic Education 2008 in the career and technology curriculum Using Jonathan Bergmann and Aaron Sams (2012) Flipped Classroom techniques, Can synthesize the hierarchy of computer skills. The Flipped Classroom techniques.

Findings/ Analysis

From the synthesis of computer skills. Using Flipped Classroom techniques to reverse. There are 5 main instruction systems: 1) Analysis and preparation 2) Prepare 3) Experimental 4) Application Create new works and 5) Summarize the results and report. The details are shown in Table 1.

1. Analysis and preparation.

1.1 Steps the teachers analyzes the curriculum and plans to prepare the instructional media. And to prepare students to learn on the Internet for students.

1.2 Teachers give students basic tasks. According to the teacher's prototype media like Mouse click Typing Printing information etc.

2. Prepare

It is a step of preparing the students for an understanding of how to practice. Before practicing by studying the details. How to teach from digital media lessons. On the Internet, after that, the students took the test after their own lessons. (Document test Or quiz in the learning system)

3. Experimental.

It mimics the work. Or take action based on classroom insights based on teacher-defined activities.

4. Application Create new work

It is up to the learner to design new pieces of knowledge learned.

5. Summarize the results and report.

It is a step for the student to write a detailed description of the work.

Table 1 shows the hierarchy of teaching styles for computer skills. Using Flipped Classroom techniques**.**

Teaching skills Computer course	**Flipped Classroom techniques**	**Teaching computer skills By using Flipped Classroom techniques**
1. analysis	1. Knowledge Steps It is a step for students to learn the knowledge provided by the teacher, such as a video, a textbook, and a source of knowledge that students find themselves. This is a period of exploration and learning.	**1. Analysis and preparation** 1.1 is a step where the instructor analyzes the curriculum and plans to prepare the instructional media. And to prepare students to learn on the Internet for students. 1.2 Teachers give students basic tasks. According to the teacher's prototype media like Mouse click Typing Printing information
2. Planning		

	2. Understanding is a way for students to understand what they have learned during their "what" and to make sure they know it in ways such as self-study. Writing Thinking Reflects Meaning Making	**2. Prepare** It is a step of preparing the students for an understanding of how to practice. Before practicing. By studying the details. How to teach From digital media lessons. On the Internet, after that, the students took the test after their own lessons. (Document test Or quiz in the system)
3. working Individual / group	3. The knowledge to try or apply. Is the stage for the students to bring knowledge. To test or apply in various ways in the classroom according to the activities that the teacher assigns or assigns the knowledge to use. (Demonstration & Application)	**3. Experimental.** It mimics the work. Or take action based on classroom insights based on teacher-defined activities.
4. Evaluate performance	4. The knowledge and practice is the work and the work is to allow students to apply knowledge to work as a piece. Creative projects As teachers have prepared. It is a learning experience.	**4. Application Create new work** It is up to the learner to design new pieces of knowledge learned.
5. Summarize 6. Present report		**5. Summarize the results and report.** It is a step for the student to write a detailed description of the work / work. Made by making up.

From the table 1. Synthesis of Computer Instructional Skills using Flipped Classroom techniques**.** Have the following strength and weakness.

Teaching computer skills

Strength

I. There are pre-operation analysis procedures.
II. The results are summarized and the report is presented. After work

weakness
Missing detail sub-step of the operating procedure.

Flipped Classroom techniques
Strength
I. Have students understand the outside of the classroom. It saves more classroom time.
II. Have the knowledge to try out before the students to practice the work.
weakness
Lack of evaluation, summary results, and presentation of work reports.

Recommendation

In this study. Researchers have synthesized theoretical papers. Computer skills core curriculum concepts Ministry of Education 2008 and study concept The process of the Flipped Classroom techniques. Until the conclusion of the model of teaching computer skills. using Flipped Classroom techniques. To verify the suitability, accuracy and completeness of the concept. Researchers should provide technology innovation experts. Measurement and Evaluation of Education And curriculum and teaching. Check the accuracy And the appropriateness of the conclusions or concepts of teaching computer-aided synthesis skills again to confirm authenticity and credibility.

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Readiness in Social Media Self-learning among Post Graduate Students at King Mongkut's Institute of Technology Ladkrabang

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Abstract

This research was aimed to obtain individuals' perceptions regarding to readiness to achieve in social media self-learning among post graduate students at King Mongkut's Institute of Technology Ladkrabang. This Descriptive Research employed the sample group of 20 students varied from year 1th till year 6th who had enrolled for the subject of English for Graduate studies in the 1st semester of the academic year of 2015. The tool used for data collection was a questionnaire aimed to assess the self-learning readiness through E-learning. There were 6 aspects comprised in the questionnaire regarding the social media self-learning--Technology Access, Online skill and relationships, Motivation, Online Audio/Video, Internet Discussions, and Importance to your success. Means, Standard deviation (S.D.), percentage, and Nonparametric Statistics were used for data analysis. The finding showed no major statistic differences among the sampled students in terms of their readiness in social media self-learning was found. All of the 6 aspects were given either high or highest importance t. Based on the academic year, the overall means was significant ($\overline{X}$ =4.34) –the freshmen owned the highest readiness ($\overline{X}$ =4.42). Based on age, the overall means was also high ($\overline{X}$ =4.34) the age between 25-34 came with the top readiness ($\overline{X}$ =4.43). Based on sex, the total means was at a high point ($\overline{X}$ =4.34) male ($\overline{X}$ =4.32) and female ($\overline{X}$ =4.36) the 2 illustrated rather close means to each other. As a result of this study, it was suggested that students should be trained to be better off on debates and discussion over the Internet to keep up with the technology. Academic innovation to upgrade the program to be more efficient for teaching and learning activities would be necessary to enhance the capabilities of the students and the lecturers.

Keywords: *E-learning ,post graduate students at King Mongkut's Institute of Technology Ladkrabang , learning readiness*

Introduction and Significance of the Problems

Readiness assessment of a student before entry into the e-learning was necessary (Aydin and Tasci, 2005). There were several factors that support e-learning such as a key factor in the readiness for e-learning was readiness of the students, readiness of teacher, information technology infrastructure, support from administrative section, culture, and interaction (So and Swatman, 2006). In addition, there were other factors affecting the readiness of teachers such as familiarity with the principles and methods of online learning, intension in use of technology in teaching and develop instructional media, ability to design for electronic content and online assessments, providing regular content and teaching methods and use a

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variety of teaching methods, etc (Eslaminejed, Masood and Ngah, 2010). All of those affect the readiness of online teaching and learning (Jira, Prachyanun and Nualsri, 2013).
Learning in new era as based on a professor Robert K Branson's research, professor of education at Florida State University: learning in globalized society evolved into a new paradigm that has developed the concept of learning by the learner. The development of learner's skill to manage their own learning (Branson, 1990). Learning methods are classified into various forms such as self-learning, remote learning which were the form of communication to facilitate learning through mobile phone or portable computer. Therefore, there were both pros and cons from data communication. Sometimes the data was wrong so students should be educated ways to consider in term of learning process, content, and using behavior as well as preventing illegal behavior in the use of social media (Phaisan and Chitsanuphong, 2013). A key success factors for managing e-learning in Thailand was supporting computer program for e-learning, good understanding in usage, good planning, attention to the selection of a new program production with the right content. The education agency must realize the importance of content, and no content that would violate laws and regulations.

Important thing before students attending into e-learning system was readiness to learn as well as ability to take advantage. When students were not ready to learn, especially for e-learning, it made the learning of the students unsuccessful (Jeuajan and Prachyanun, 2013). E-learning would be a useless tool for students who were not ready to learn. The instrument to assess the readiness was the questionnaire of readiness assessment for e-learning (Watkins, Leigh and Triner, 2004) by measuring the levels of readiness in six dimensions: technology access, online skill and relationships, motivation, online audio/ video, internet discussions, and importance to success. This research would help ensure that students were ready for development in which particular area and lead to the creation of new management knowledge.

Objectives Research
1. Readiness in social media self-learning among post graduate students at King Mongkut's Institute of Technology Ladkrabang
2. To compare the difference of Readiness in social media self-learning among post graduate students at King Mongkut's Institute of Technology Ladkrabang

Hypothesis
The students with different academic years, ages, and genders had different level of readiness for e-learning.

Research Methodology
The sample in this Descriptive Research employed the sample group of 20 students varied from year 1th till year 6th who had enrolled for the subject of English for Graduate studies in the 1st semester of the academic year of 2015.The variable factors used in the study were independent variable such as demographic characteristics of the population. Dependent variables were technology access, online skill and relationships, motivation , online audio/ video, internet discussions, and importance to success.
In this study, the researcher would conduct the data collecting on one's own. By means of questionnaires, the researcher let the samples filled in the questionnaire themselves (Self-Administered Questionnaire), then collected the questionnaire and checked the validity for data analysis.

Tool used in this study was questionnaire for readiness assessment of students for e-learning, it was developed to Thai language (Watkins, Leigh and Triner, 2004). The questionnaire was divided into 2 parts: section (1) answerer's personal information and section (2) which was divided into six areas such as technology access, online skill and relationships, motivation, online audio /video, internet discussions, and importance to success. The questionaire were five-level scale (Rating scale). The fifth level refered to the opinion of "strongly agree", the forth level refered to "agree", the third level refered to "moderate", the second level refered to "disagree", and the first level refers to "strongly disagree". There were twenty seven questions put to the study to found out the reliability and collected data.

After data collection, entered the answer into code and process by SPSS program and then presented the research as the following formats: analysis of the demographic characteristics data of graduate students of of graduate students at King Mongkut's Institute of Technology Ladkrabang, frequency of use, mean in percentage and standard deviation (SD). Data from this research was determined the primary result by the comparison of mean value and criteria base on Best's concept (Best, 1977), five-level rating (Rating Scale) as follows: mean 1.00-1.50 referred to the least level of e-learning readiness of the students, mean 1.51-2.50 referred to less level, mean 2.51-3.50 referred to moderate level, mean 3.51-4.50 referred to high level, and mean 4.51-5.00 referred to the most level. Then the mean values were compared with the readiness of the students in six dimensions and compared between each different academic year, age, and gender by using statistical analysis of Non Parametric Test.

Research Result

The results showed that the readiness for self-learning by using social media or e-learning in the 6 dimension (technology access, online skill and relationships, motivation, online audio/ video, internet discussions, and importance to success) of the students has no statistically significant difference at the .05 level in all six academic years, ages, and genders.

Gender	**Age**	**Student**			
		first year students	**The second year students**	**The third to sixth year students**	
Male	25 – 34 years	2	1	-	3
	35 – 44 years	4	3	-	7
	More than 45 years	1	-	-	1
Female	25 – 34 years	4	-	2	6
	35 – 44 years	1	1	1	3
Total		12	5	3	20

Table 1: Background of the respondents

From 20 respondents, it was found that the first year students aged between 25-34 years were male 2 people and female 4 people, aged between 35-44 years were male 4 people and female 1 people, age over than 45 years were male 1 people. The second year students aged between 25-34 years were male 1 people, aged between 35-44 years were male 3 people and female 1 people. The third to sixth year students aged between 25-34 years were female 2 people, aged between 35-44 years were female 1 people.

	The Readiness for e-Learning	$\bar{X}$	**S.D.**	**Level**
1	Technology Access	4.68	.477	The highest
2	Online skill and relationships	4.55	.430	The highest
3	Motivation	3.88	.818	The high

4	Online Audio/Video	4.31	.658	The high
5	Internet Discussions	4.42	.513	The high
6	Importance to your success	4.22	.767	The high
	Total	4.34	.488	The high

Table 2: Mean and standard deviation of e-learning readiness by using social media in 6 dimensions of graduate students of King Mongkut's Institute of Technology Ladkrabang in every academic years.

Table 2 showed the readiness of learning in six dimensions of graduate students of KMITL in every academic years had mean at a high level ($\overline{X}$ =4.34). The readiest dimension was technology access ($\overline{X}$ =4.68) and Online skill and relationships ($\overline{X}$ =4.55) accordingly.

	Student	$\overline{X}$	**S.D.**	**Level**
1	first year students	4.42	.542	The high
2	The second year students	4.17	.457	The high
3	The third to sixth year students	4.32	.542	The high
	Total	4.34	.488	The high

Table 3: Mean and standard deviation of e-learning readiness by using social media in 6 dimensions of graduate students of King Mongkut's Institute of Technology Ladkrabang in each academic year.

Table 3 It showed that the readiness for e-learning in all six dimensions of each academic year students had total mean at high level ($\overline{X}$ =4.34) by this the first year students won the most readiness ($\overline{X}$ =4.42).

	Age	$\overline{X}$	**S.D.**	**Level**
1	25 – 34 years	4.43	.503	The high
2	35 – 44 years	4.34	.438	The high
3	More than 45 years	3.55	-	The high
	Total	4.34	.488	The high

Table 4 : Mean and standard deviation of e-learning readiness by using social media in 6 dimensions of graduate students of King Mongkut's Institute of Technology Ladkrabang in each academic year divided by age range.

Table 4 It showed that the e-learning readiness in six dimensions of graduate students at KMITL in every academic years and ages had mean value at high level ($\overline{X}$ =4.34). Age between 34-25years had the most readiness ($\overline{X}$ =4.43).

	Gender	$\overline{X}$	**S.D.**	**Level**
1	Male	4.32	.521	The high
2	Female	4.36	.481	The high
	Total	4.34	.488	The high

Table 5: Mean and standard deviation of e-learning readiness by using social media in 6 dimensions of graduate students of King Mongkut's Institute of Technology Ladkrabang in every academic years divided by gender.

Table 5 It was found that the readiness for learning of graduate students at King Mongkut's Institute of Technology Ladkrabang in every academic years divided gender had

mean value at high level) $\overline{X}$ =4.34), for male $\overline{X}$ =4.32 and for female $\overline{X}$ =4.36 which were similar.

Discussions

The research found that there was no significant statistically difference in the readiness for self-learning of graduate students of King Mongkut's Institute of Technology Ladkrabang in the six dimensions (at .05 level). All six years students were ready to learn and paid attention much up to the most on all six dimensions in assessment. It showed that the graduate students of King Mongkut's Institute of Technology Ladkrabang recognized the benefits of self-learning by using social media or e-learning and the importance of access to technology with the most average value because they could find information from the database e.g. theory, concept, literature, and related research. Meanwhile, the average value of the learning support was at the second. Electronic media could supports doing research of the student in synthesis of a new knowledge. The first year students hold more average value than the second and the third-to-sixth year students. It was because at the first year, students had to do more coursework or writing articles and they find data online and learn on their own a lot. By comparison between male and female in all of the 6 dimensions, it found that the readiness for self-learning or e-learning of both was in similar level. That was consistent with the Horton's mention (Horton, 2012).

Conclusion

Graduate students of King Mongkut's Institute of Technology Ladkrabang were ready for self-learning by using social media or e-learning. Most of the students worked and had a regular income, had experience and high responsibility, realizing the importance of technology and electronics, particularly in research for creating a new theory needed to have external consultants and experts (in accordance with the research of Phaisan and Chitsanuphong, 2013 so students did not need to study only in class. There was other research and knowledge outside classroom through social and electronic media that student could learn by themselves. Students could take the data to analyze and support research, then discuss with the consultant via internet network. Education institute should organize a proper education in using social media or electronic media, made the students realize the advantages and disadvantages of using in order to protect themselves against the abuse of other privacy right which affect the development of educational technology of Thailand for keeping pace with changes in society (in according with research of (Thatsanee , Chantana and Chaiyong, 2013) A Study of Privacy Violation Behaviors in Using Social Media by Graduate Students at King Mongkut's Institute of Technology Ladkrabang. A key success factors for managing e-learning in Thailand was supporting computer program for e-learning, good understanding in usage, good planning, attention to the selection of a new program production with the right content.

Recommendations

To develop the potential of Thai educational technology to keep up with current social conditions. The changes that occur in today's society. Include government efforts to develop e-learning skills that play an important role in today's learning society. Including importance is the understanding of the content and procedures. Must comply with the law no content or behavior that may violate any applicable law or regulation. Training should be provided to educate students about modern Internet skills in order to keep up with today's social environment, and educational innovation should be developed to develop effective programs for instructional students. Academic innovation to upgrade the program to be more efficient

for teaching and learning activities would be necessary to enhance the capabilities of the students and the lecturers of graduate students at King Mongkut's Institute of Technology Lat Krabang.

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Development of Factors and Indicators of Teachers' Learning Innovations

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ABSTRACT

The purposes of this research were to develop the Factors and Indicators of Teachers' Learning Innovations. The research was divided into two phases; (I) The model was built from synthesizing the factors using synthesis documents and in-depth interviews from five selected experts (purposive sampling). The instrument used in this study was a semi-structured interview. Data was analyzed using quality content. (II) The Measurement model examined consistency using Confirmatory Factor Analysis. The sample included 800 teachers and administrators from 200 schools in Thailand, using multi–stage sampling. The instrument used in this study was a questionnaire about teachers' learning innovations. Data was analyzed using CFA. The research found that;

1) Factors and Indicators of the Teachers' Learning Innovations had 4 factors, and 15 indicators. These components are: (1) Innovation novelty had 2 indicators, (2) Innovation value had 4 indicators, (3) Innovation development process had 5 indicators, and (4) Innovative application had 4 indicators.

2) Measurement model of Teachers' Learning Innovation is consistent according to the structure, value of χ^2 = 56.567, df = 39, p = .080, χ^2/df = 1.450, CFI = .996, TLI = .989, RMSEA = .012, SRMR = .006. Factor loading of Innovation novelty was at .672, Innovation was at .841, Innovation development process was at .881, and Innovative application was at .850, statistically significant at .01.

Keywords: *Factors Analysis, Development of Indicators, Teachers' Learning Innovations.*

Introduction

Thailand is entering the "Thailand 4.0" era that must drive Thailand's reform to cope with the opportunities and threats of the 21st century, by driving with "innovation". Innovation is causes the formation of many new products, new service and new processes, the foundation of innovation comes from creativity or production that can solve new problems. (Mumford & Gustafson, 1988; Shalley & Zhuo, 2008) The key success factor of the education system for promoting innovation and creativity is to give students has learning and creativity skills to innovate and promote sustainable economic growth in the future. The teacher is a facilitator who encourages students to innovate their own ideas through various learning and teaching processes.

Creating teachers' learning innovation is important that the school must support it all the time. In the National Education Act, 1999, there were provisions relating to educational technology and educational innovation. (Ministry of Education, 2003) The teachers' learning innovation must be designed, experimented and developed to be credible, by adopting a

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research model to support the decision whether to accept innovation. (Rogers, 1995; Khamanee, 2014)

Therefore, the researcher is interested in studying the development of factors and indicators of teachers' learning innovations. This research will lead to the development of MSEM of factors affecting teachers' learning innovations, to guidelines for the management of educational that encourage the teachers' learning innovations next.

Objective

To develop the factors and indicators of teachers' learning innovations

Methods

Phase 1: Stimulating and developing the components and indicators of teachers' learning innovations, by reviewing the relevant literatures and in-depth interviews with experts, the sample consisted of 5 experts (Purposive sampling) was used by the academic experts, policy experts in Ministry of Education and operation experts. The instrument used for this research was semi-structured interview using content analysis.

Phase 2: factors and Indicators of teachers' learning innovations by confirmatory factors analysis. The samples were 800 teachers and administrators in 200 schools under the Office of the Basic Education Commission, by multi-stage sampling and use the number of teachers and administrators in random unit. Instrument used for this research was questionnaire consisted of 40 items, with t values ranging from 1.99 to 5.27 and reliability of .984. Bartlett's Test Sphericity Statistics Kaiser-Meyer-Olkin Statistical Measurement Sampling Value (KMO) Multicollinearity by analyzing Correlation Coefficient of variables, also analyzing Tolerance, Variance Inflation Factor (VIF), and Condition Index. Validate the Measurement Model using Confirmatory Factor Analysis with a computer program.

Results

1) Teachers' learning innovations has 4 factors and 15 indicators, including; Innovation novelty 2 indicators, Innovation value 4 indicators, Innovation development process 5 indicators and Innovative application 4 indicators.

2) The analysis of factors and indicator of teachers' learning innovations are structurally consistent with values $\chi^2 = 56.567$, df = 39, p = .080, $\chi^2/df = 1.450$, CFI = .996, TLI = .989, RMSEA = .012, SRMR = .006, show details below.

Table 1 Factor loading and reliability of Key factors in Measurement model of Teachers' Learning Innovations

Key factors	Matrix of Factors Loading			
	β	SE	t	R^2
Teachers' Learning Innovations	.672	.021	31.637**	.452
- Innovation novelty	.841	.013	66.615**	.707
- Innovation value	.881	.010	84.018**	.775
- Innovation development process	.850	.012	70.714**	.723
- Innovative application				

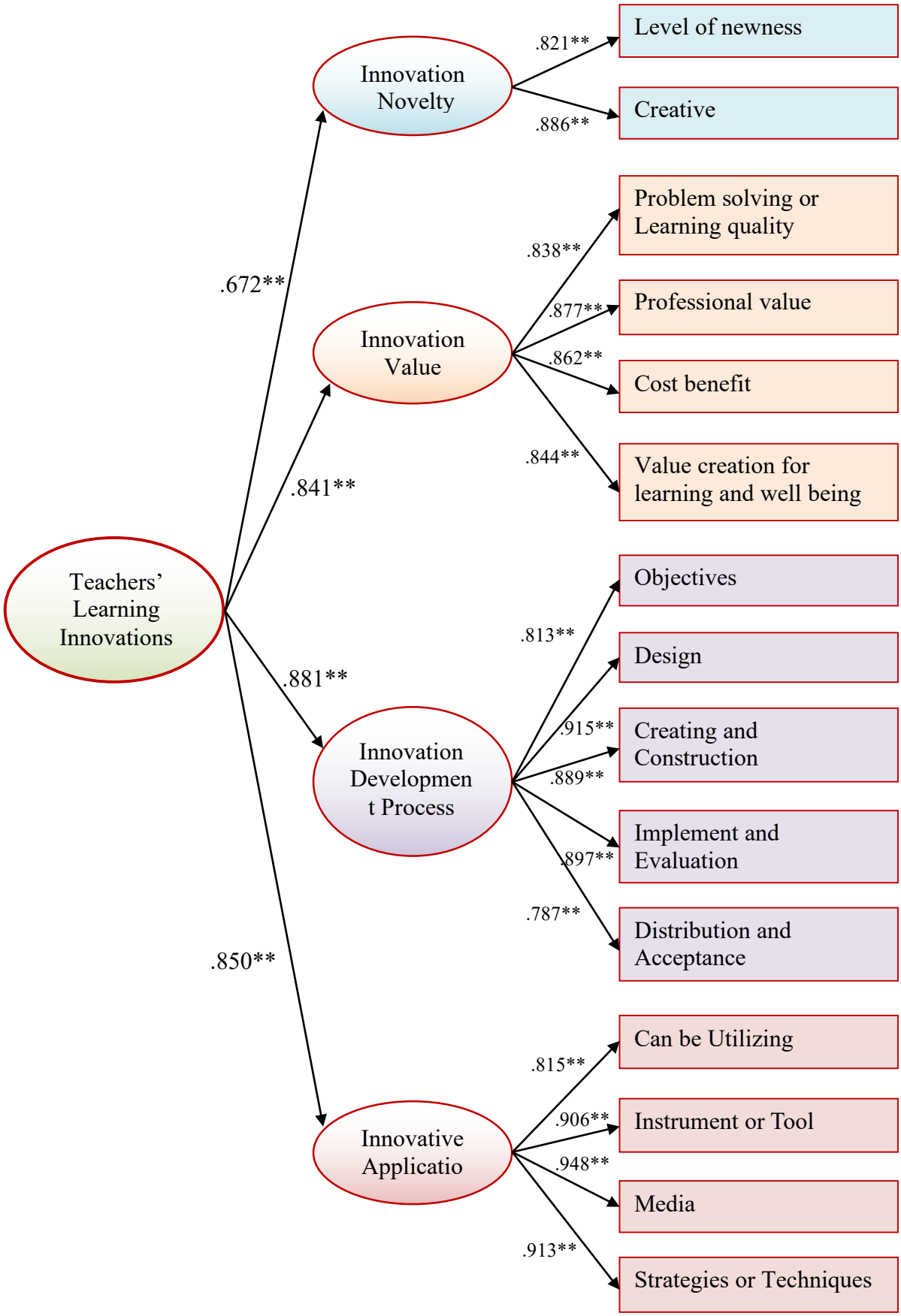

Figure 1 Model of Factors of Teachers' Learning Innovations

Table 2 Factor loading and Reliability of Indicators in Measurement Model of Teachers' Learning Innovations

Factors/Indicators	Matrix of Factors Loading			Factor score	R^2
	β	SE	t		
Innovation Novelty					
- Level of newness	.821	.011	72.213**	.248	.673
- Creative	.886	.010	87.557**	.401	.785
Innovation Value					
- Problem solving or Learning quality	.838	.009	97.495**	.157	.702
- Professional value	.877	.007	123.772**	.198	.769
- Cost benefit	.862	.008	113.215**	.172	.743
- Value creation for learning and well being	.844	.008	101.033**	.144	.712
Innovation Development Process					
- Objectives	.813	.009	88.770**	.090	.661
- Design	.915	.005	182.619**	.221	.836
- Creating and Construction	.889	.006	148.138**	.154	.791
- Implement and Evaluation	.897	.006	157.706**	.184	.805
- Distribution and Acceptance	.787	.010	77.142**	.068	.619
Innovative Application					
- Can be utilizing	.815	.012	65.932**	.154	.749
- Instrument or Tool	.906	.008	120.671**	.171	.765
- Media	.948	.006	168.173**	.259	.836
- Strategies or Techniques	.913	.007	137.778**	.211	.798
$\chi^2 = 56.567^*$, df = 39, p = .080, $\chi^2/df = 1.450$, CFI = .996, TLI = .989, RMSEA = .012, SRMR = .006					

Note ** $p < .01$

Discussions

Factors and indicators of teachers' learning innovations are structurally consistent Therefore, teachers' learning innovations should have 4 key elements: (1) Innovation development process is the process of designing and developing the innovation. This requires research and development to support the credibility of the process of innovation development, in order to provide a more conducive learning experience for the learners. (2) Innovative application is the ability of teachers to apply learning innovation in real life situations can be easily experimented, easy to understand, not easy to achieve the target clearly. There is good evidence that it has worked well and has been used to apply widely, to increase the efficiency and effectiveness of teacher management, by focusing on student-centric approaches, information technology is used for learning, have group work participatory learning, promote inquiry base learning, learning by doing, solving problems, using creativity and motivating learners. (3) Innovation value is the gains in various aspects from innovation to problem solving or quality development, learners facilitate, be indicator of teacher quality, important for a professional, be in line with the cost-effective resource principles, generate learning together and encourage the process of seeking knowledge, that results in benefits to teachers, administrators, schools, professional and community are recognized. (4) Innovation novelty is

the level of newness and Creation of innovation to be modern and cutting edge. This is a new development and is not part of the current system, based on performance, methodology, process, or knowledge, which affects quality goals. There are striking novelties and innovative things that one may not be innovative in other places, depends on the environmental factors involved in the innovation. This is consistent with the concept of "Thailand 4.0" that has driven the country's economic reforms to cope with the opportunities and threats of the 21st century, by driving with "innovation". Innovation is causes the formation of many new products, new service and new processes, the foundation of innovation comes from creativity or production that can solve new problems. (Mumford & Gustafson, 1988; Shalley & Zhuo, 2008) Many countries overlook the key success factors of the educational system's ability to promote innovation and creativity, 21st century skills that focus on children's learning and creative skills to innovate to promote sustainable economic growth in the future. It is a source of new educational direction that emphasizes the learning process more than knowledge. (Patrawat, 2013) Teachers and students are important to the quality of education, because of the quality of the students depends on the quality of the teacher (McKinsey, 2007; Samakoses, 2010; Sirirangtasri, 2014). The factors in promoting innovation are driven by internal and external factors that motivate teachers to innovate effective teaching and learning. (Lawang, 2009; Chimthongdee & Gamket, 2015)

Recommendations

Teachers' learning innovation is important that the school must support it all the time, which innovation is a contemporary thing does not fall. In general, innovation often consists of (1) development process, (2) application, (3) value, and (4) novelty. The next research recommendation is to research the factors that promote problems and obstacles in the development of teachers' learning innovation to build a diverse and profound knowledge further.

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Thai Higher Education Identity: Remained or Lost?

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Abstract

Higher education is an optional level of schooling system after finishing from upper secondary school, which is also called the temple of learning. Because of the rapidly changed of globalization, most of higher education institutes have to concern how to keep their identity by reconstruction in every sphere of educational orientation. The important paths for fruitful kept for Thai higher education institutions are as the followings,1 Restoration of instructors 2 Restoration of learning methodologies and processes 3 Restoration of learners ideology and 4 Restoration of assessment process.

Keywords: *Identity, Restoration, Remained or Lost?*

Introduction

Higher education normally refers to the education in colleges and universities after completion from upper secondary school. Thailand has a large higher education system. It has more than 100 universities and over colleges both into the state and private ones, with more than 20 million students.These includes higher education in the fields of technical, medical, law, forestry, etc. The present situation of higher education system in Thailand is complex and challenging. With the increasing of the population, there has been surge in the number of students seeking admission in these universities and colleges for higher education, which is the serious problem for the students who finished from the upper secondary school level. In the field of higher education in Thailand, there was the time when population of the country was much lesser and higher education was accessible to all and everyone. As we known already, we are now in the globalization some communities of learning in this level are now lost their identity. So the Thai expectation on higher education is still the challenge of restoration for change.

The Development of Identity Building

In the present situation Thai students find a staggeringly high cut-off percentage for admission such as 80%, 85% even 90% in some subjects in prestigious universities and colleges. This again is a grim scenario, causing distress disappointment even leading to deep depression among the admission seekers. Such situation affects the mental condition of the students. However, it is true that only the deserving should seek admission and granted admission. Most of them want to be one of the old universities or colleges because of fashionable value. However, the streams for higher education have been diversified in a large way. There are several options for the admission seekers, but qualifications and competitions at every stage are to be presented and faced. Identity building or creation is very important factor for university administration and management, and it also is the way of promoting for the students admission,too. The situation of higher education has been changed in each period

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because of the educational contextualization. Thai higher education institutions are usually named in the place of " the national intellectual incubation" , in this reason those try to make and build themselves for the strength of their identity.Thai higher education identity can be in periodical description as follows,

1) The identity in the period of "the Learning Temple" , the beginning of higher education in Thailand dates back to the latter part of the nineteenth century when King Chulalongkorn (Rama V) introduced visionary education reforms after he assumed the throne in 1868. Centers of higher education incorporating elements of western influence were established and subsequently flourished. The history of higher education in Thailand can be divided into three periods: the Early Modernization Period (1889-1931), the Post Revolution Period (1932-1949), and the Development Planning Period (1950-present).

2) The identity in the period of the "National Labour Building" ,within a decade of the first national economic and social development plan, the regional universities Chiang Mai University, Khon Kaen University, and Prince of Songkla University were established successively from 1964 to 1967 as part of the education decentralization programme. In addition to the establishment of regional universities, other important developments arose in the late 60s and early 70s, such as the Asian Institute of Technology and the National Institute of Development Administration (NIDA).Soon after, more higher education institutions were formed. In 1971, King Mongkut's Institute of Technology was established through the merging of several technical schools and has since been developed into three independent institutes. Srinakharinwirot University, established in 1974, followed a similar process of establishment. Maejo Institute of Agricultural Technology, subsequently becoming Maejo University, was upgraded from a college under the Ministry of Education to a university in 1975.

Around this time, private higher education institutions began to play a role in higher education provision, thus allowing more Thai youth to gain tertiary qualifications. The Sixth National Higher Education Development Plan (1989-1991) gained great attention and focus from the government, particularly in financial support for private tertiary institutions to further improve their standards of education and provide more education programs. Private higher education institutions expanded in Bangkok and other provinces to accommodate the social demand for higher education and the need to strengthen educational development of the country. Private universities and colleges also began to offer international programmes to enhance internationalization of Thai higher education.

3) The identity in the preiod of the regional knowledge distribution ,the 1990s, six more regional universities were established: Burapha University, Naresuan University, Mahasarakham University, Thaksin University, Ubon Ratchathani University, and Suranaree University of Technology.

A significant innovation during the Development Planning Period was the initiation of two open admission universities: Ramkhamhaeng and Sukhothai Thammathirat, which opened in 1971 and 1979 respectively. These two universities provide an effective and economical way to respond to the growing public demand for access to higher education. Both make use of modern technologies such as radio and television to broadcast tutorials to a wider audience. As a result, the two universities presently share around sixty per cent of all

tertiary enrolments. Currently, Ramkhamhaeng University also delivers closed admission study programmes in 16 undergraduate programmes as well as all of its master's and doctoral degree programmes. By the way of the Suranaree University of Technology, founded in 1990, is the first public university in the country to operate independently from the government bureaucracy with its own autonomous administration system and with government financial support in the form of block grants. It was hoped that it would become a model for other public universities seeking to become autonomous in the future. Walailak University, the second of its kind, opened its doors to students in 1998. In early 1998, King Mongkut's Institute of Technology Thonburi was also upgraded to be an autonomous university and renamed King Mongkut's University of Technology Thonburi. Mae Fah Luang University, another autonomous university, was established in 1998 in Chiang Rai.

The Development of Rajabhat Universities ,40 Rajabhat Universities were formerly Rajabhat Institutes before being upgraded to university status and falling under jurisdiction of the Office of the Higher Education Commission. Dealing with education at an advanced level, the universities operated under supervision of the Rajabhat Council under the Ministry of Education and are scattered in the big cities throughout the country. In order to serve the different regions of Thailand, they have been divided into eight clusters. The Rajabhat University Act of 2004 stipulates coordination of the strengths of Rajabhat Universities in order to aid development of the regions. Although Rajabhat Universities have become separate legal entities, there is still a joint committee that consists of representatives from each Rajabhat University.

As above mentioned on the projection of Thai higher education development, they significantly try to build "the sphere of life-long learning" into every area in the nation. The national education policy consequence into the global as "Education for All and All for Education" is the main stream of the drive of the Ministry of Education and all of sectors responsibilities. The situation of Thai higher education in this period can be said that " the time for knowledge distribution to home and roaming people by education." Every higher institutions play the major role of giving the pedagogic opportunity for all of habitants. So the phenomenon of both private state higher education institutions are increased.

Identity Reform Why Restoration?

In the post-modernization era, every sphere of deconstruction is very important to be reformed and reconstructed as education situation. Reform is meant to make an improvement, especially by changing while the word of restoration refers to the process of building or creating something again that has been damaged or destroyed. These two words have the latent meanings both into the means and the outputs. Thus, my previous projection of the picture on Thai higher education identity is the great of building and remained, however, if having any improvements should be in the appropriateness of the basic nation contexts. My sincere recommendations for the Thai higher education for the sustainable reconstruction can be done as the follows;

1) The Restoration of Instructors Identity, Instructors in this level have to be strong in academic pursuit and both in science of teaching and art of teaching. Science of teaching normally engaged of teacher profession, principle of teaching, method, techniques and training and re-training. In the opposite side of art of teaching can be concluded in learning instruction, learning construction, teachers' personality or characteristics, interaction between teacher and learners, and academic atmospheres while teaching. If the instructors can do as these mentioned, the learners'

achievement will be fruitful of knowledge, morality and total happiness. In general views of outsiders for the instructor reconstruction in this way will be appreciated as ***" the Mothership of Education" not Enemy of Education".*** In the general views instructor should be as ***"Teacher not Teller"***

2) The Restoration of Learning Processes Identity, Learning processes in the post – modernization era there are several methodologies of teaching ,the best one is the content-based teaching that the writer would like to discuss that if the teachers especially who teach in this level have to be excellent and smart in academic contents provided to the learners. Case study teaching, phenomenon-based teaching, project-based learning and problem-based learning are arranged and motivated into the class. The identity in the learning processes is ***"how to make learners happy more a picture, how to make the learner as the creator than the copier"*** . In the last of learning processes, asking the productive mind of the learners is very important that the phase of ***"can do or can be done".***

3) The Restoration of Learners' Ideology Identity, In this point of views Thai higher education must point at the agenda of brand loyalty at the old institutions while encourage them to be faithful in every institutions that make scholars and make them to be public mind person. Creation the learners twin to knowledge and morality is the diamond of the nation ,strongly emphasized on theories to actions for the changing world and how to spent their meaningful daily life perfectly.

4) The Restoration of Assessment Identity (evaluation and measurement), the metaphysics (Sum mum Bonum) of assessment in the higher education is not only passing the criteria of instructors but also external influential factors concerned. As a matter of fact, test or final examination normally show the binary of power, ***"instructors as exploiting while learners as exploited".*** Final examination is the picture of " technology of power" so the right assessment should be done critically in the knowledge implementation more remember and understanding

Conclusion

In the present day of situated knowledge, Thai higher education institutions must concern how to keeping their identity for sustainability since educational colonialism rapidly effect each other both into the joint program, dual degree which the learners can enroll and put into the admission. Identity in each Thai higher education is very important, the government must play the great attention to the national policy fit into the national education system and keep their institutionalization. Moreover, both of private and state high education will be kept in the way of thinking that " it is the collective khramma of Thai people"

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The Implementation of Scrabble Playing Methods to Improve the Ability of Early Reading of Mentally Disabled Students of Second Grade In SLB (Special School) YPAC Makassar

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Abstract

The ability of mentally disabled students of second grade in SLB YPAC Makassar in early reading is still very low. So that, to improve the ability of early reading beginning is tried by applying Scrabble Playing method. The purpose of this research is to know the implementation of Scrabble Playing method in improving the reading ability of the mentally disabled students of second grade in SLB YPAC Makassar. This research uses quantitative approach and use type of experimental research method. The experimental research design used is Single Subject Research A-B-A (A (Baseline 1) - B (Intervention) - A (Baseline 2)). Subject of this research namely Ag, Alf, and Dn. Data collection techniques in this research is through tests and observations. The data obtained is processed with descriptive approach.
The result of the research shows that the ability of early reading of the mentally disabled students of second grade in SLB YPAC Makassar after using Scrabble Playing method can reach the target behavior, although the subject Dn is not optimal. Based on the results of this study it can be concluded that the implementation of Scrabble Playing method can help improve the early reading ability of the mentally disabled students of second grade in SLB YPAC Makassar.

Keywords: *Early Reading, Mentally Disabled Student, Scrabble Playing Method*

Introduction

Children with intelligence or mental retardation barriers are real children who are experiencing barriers and intellectual development is far below the average is associated with difficulty to adapt in real social life. In the case of intellectual development, children with mental disabilities have difficulty in mastering basic skills in academic, ranging from reading, writing, and arithmetic. However, the child's tunagrahita needs to master language skills, especially reading. Reading ability is a necessity, as most information / knowledge is presented in written form and can only be obtained through reading.

One of the important stages in learning to read is to read the beginning. The initial reading stage generally begins when students enter the first grade. In students with mild tunagrahita, the readiness to learn to read a new beginning begins at the second or eighth grade. In fact there are also new to learn to read at the age of nine years. This depends on the level of maturity and thinking ability of students with mild tunagrahita.

Reading the beginning is one of the most desirable abilities, but for light-hearted students it is not an easy thing. Mild tunagrahita students have difficulty in reading the

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beginning, which is characterized by difficulty recognizing and discriminating the typeface, the difficulty of assembling letters into syllables or being simple words.

The lack of early reading ability is closely related to the characteristics of students with mild tunagrahita whose learning capacity is limited, especially in the study of abstract matters. They have difficulty in focusing, forgetful, and incapable of making associations, involving physical and mental activity. Physical activity includes eye movement and visual acuity. Mental activity includes attention and memory.

Abdurrahman (2003) suggests that reading skills evolve through several stages: the growth stage of reading readiness, the early stages of reading, the development of reading skills, and the perfection of reading skills. Each step is adjusted to the ability of each child because reading is not only related to the development of eye movement but also cognitive development.

Early reading generally exist at the time of arrival of the sensitive, ie children aged six years or seven years for normal children or the age of nine or ten years in children with intellectual challenges "(Mandala, 2009). At the beginning of the reading stage, the mastery of the number of words of the child is still limited and not fully mastered the alphabet. So there are letters that difficult to pronounce and often read incorrectly, and the difficulty of making a discourse. The right development at this early reading stage is necessary, usually the most appropriate and appropriate age of the child is reading while playing.

One form of mental retardation games that stimulate children to recognize letters, stringing letters into syllables, and stringing syllables into words is a game of scrabble.S *Crabble* is a type of word game that consists of a letter that can be linked into syllables and can be played by 2, 3, or 4 participants within a certain time. Assuming that through the application of play methods then in the initial reading learning will create a fun learning atmosphere, not rigid and make students feel at home to learn. Through play methods students will not realize that they are learning because learning is packed with the game. It is hoped that by using a modified scrabble game according to the characteristics and abilities of the tunagrahita pupils, students' reading ability can be improved.

Design/Procedure

This research uses quantitative approach and type of experimental research method. The experimental research design used is ABA Single Subject Research. (A-1 Baseline 1), (B Intervention), (A-2 Baseline 2). A-1 (Baseline 1): the absence of treatment is obtained before the implementation of a method of playing *scrabble.* B (Intervention): treatment during the application of methods of playing *scrabble.* A-2 (Baseline2): the absence of treatment obtained after applying the method of playing *scrabble.* This study aims to determine the beginning of the students improved reading skills mild mental retardation base class II in SLB YPAC Makassar through the application of methods of playing *scrabble.* 3 students study subjects mild mental retardation, ie Ag, Alf, and Dn. Data collection techniques used are tests and observations.The data obtained is processed descriptively.

Findings/Analysis

Baseline Result 1 (A-1)

The first step in this study is to measure the ability to read the beginning of research subjects prior to the application of scrabbel play methods. Measurements are repeated until a

stable condition is obtained. After a four-session measurement, the data obtained is considered stable. The data obtained are presented in table 1 below.

Tebl 1. Baseline 1 Reading Ability Data Baseline 1 (A-1)

Target Behavior	Session	Ag				Af		Dn	
		Score	Percent			Score	Percent	Score	Percent
The ability to read the beginning	1	24	40			21	35	13	22
	2	23	38			21	35	15	25
	3	24	40			20	33	13	22
	4	24	40			21	35	13	22
Σ		95	158			83	138	54	91
Mean		23.75	39.5	20.75	34.5	13.5	20.75	13.5	22.75

To facilitate the understanding table 1, the data subject's ability to read the beginning of Ag, Af, and Dn at *baseline* phase 1 (A-1) is visualized as follows:

Graph 1. Baseline Reading Capability Baseline 1 (A-1)

The data of the measurement results in the Baseline 1 (A1) phase indicates that the mean reading level of the beginning of the three subjects is included in the low category, but in a stable state, so that it can be continued in the Intervention phase.

Intervention Results (B)

Intervention data (B) early reading ability of Ag, Af, and Dn subjects was treatment data through the application of scrabble play method. Data collection during the intervention phase (B) is given as many as 11 sessions, each time is done with time for 2 x 30 minutes. Data reading ability beginning of Ag, Af, and Dn subjects through the application of scrabble play method seen in table 2:

Tebl 2. Data Reading Ability Beginning Intervention Phase (B)

Target Behavior	Session	Ag		Af		Dn	
		Score	Percent	Score	Percent	Score	Percent
The ability to read the beginning	1	25	42	22	37	13	22
	2	55	47	25	42	15	25
	3	33	55	28	47	13	22
	4	35	56	33	55	13	22
	5	40	67	35	58	17	28
	6	40	67	25	42	16	27
	7	40	67	28	47	18	30
	8	41	68	33	55	20	33
	9	43	72	35	58	20	33

	10	43	72		40	67	21	35
	11	43	72		41	68	20	33
Σ		438	685		345	576	186	310
mean Level		62.4	20.75	34.5	13.5	22.5	57.4	28.1

Intervention data analysis (B) subjects showed a mean level of 62.4 Ag; Af subject indicates mean level 57.7; And the subject Dn indicates the mean level 28.1 as the basis for continuing data collection through the Baseline 2 (A-2) phase.

To facilitate understanding of Table 2, the data subject's ability to read the beginning of Ag, Af, and Dn in *the intervention* phase (B) is visualized in the chart 2.

Graph 2. Literacy Starters subject of Ag, Af, and Dn in *the intervention* phase (B)

Intervention data analysis (B) subjects showed a trend of stability Ag 63%, Af subjects showed a trend of stability Dn 72% and showed a trend of stability subject to 45%, as a basis to continue baseline data collection through phase 2 (A-2).

Baseline Result 2 (A-2)

At baseline 2 (A2) data collection performed 5 sessions where each session with time for 2 x 30 min. Early reading ability data subjects Ag, Af, and Dn at baseline phase 2 (A2) shown in Table 3.

Table 3. Data Early reading ability at *baseline* phase 2 (A-2)

Target Behavior	Session	Ag		Af		Dn	
		Score	Percent	Score	Percent	Score	Percent
The ability to read the beginning	1	35	58	38	64	15	25
	2	38	63	39	65	18	30
	3	42	70	41	68	21	35
	4	42	70	41	68	21	35
	5	42	70	41	68	21	35
Σ		199	331	200	333	96	160
Mean			66.2		66.6		32

Analysis of baseline data on phase 2 (A-2) subjects showed a mean level of 66.2 Ag; The Af subject indicates a mean of level 66.6; And subject Dn indicates the mean level 32.

To facilitate understanding of the above table, the data subject's ability to read the beginning of Ag, Af, and Dn at *baseline* phase 2 (A-2) are visualized in graph 3 as follows:

Graph 3. Literacy Starters subject of Ag, Af, and Dn at *baseline* phase 2 (A-2)

Inter Analysis of Subject Conditions Ag

Comparison of conditions	B / A 1	B / A 2

1.	Number of variables changed	1	1
2.	Changes in trend direction and its effects		
3.	Changes in the tendency of stability	Stable to variable	Variable to stable
4.	Level change	(40 - 42) = -2	(72 - 58) = +14

Calculating level changes:

Data points in the *baseline*condition 1 ($A_{1)}$ in the session - the last	The first session on the intervention condition (B)	Change level
40 -	42	-2
Data point on condition of intervention (B) at session - last	The first session on *the baseline* condition 2 ($A_{2)}$	Change level
72 -	58	+14

	Comparison of conditions	B / A_1	A_2 / B
5.	Percentage overlap	0%	20%

The result of inter-condition analysis for Ag subjects shows that the percentage of overlap is 0% and 40%. The percentage of 0% is obtained from *the baseline* phase 1 (A = -1) to the intervention phase (B) the lack of application of methods of playing *scrabble* so as not to show an increase in the ability to read the beginning of the subject as one of the students Ag mild mental retardation in the base class II SLB D YPAC Makassar. The percentage of 40% is obtained from the intervention phase (B) to the *baseline* phase 2 (A-2) which showed an increased ability to read the beginning through the application of a method of playing *scrabble* by 40% as a percentage depicted above. Thus it can be concluded that the intervention of the application of a given method of playing *scrabble* can help improve the ability to read the beginning of the subject Ag.

	Comparison of conditions	B / A-1	B / A-2
1.	Number of variables changed	1	1
2.	Changes in trend direction and its effects		
3.	Changes in the tendency of stability	Stable to variable	Variable to stable

4.	Level change	(35 - 37) = -2	(68 - 64) = +14

Calculating level changes:

Data points in the *baseline*condition 1 ($A_{1)}$ in the session - the last	The first session on the intervention condition (B)	Change level
35 -	37	-2
Data point on condition of intervention (B) at session - last	The first session on *the baseline* condition 2 ($A_{2)}$	Change level
68 -	64	+4

	Comparison of conditions	B / A = 1	A-2 / B
Percentage overlap		0%	20%

The result of the analysis between the subject conditions of Af shows that the percentage of overlap is 0% and 40%. The percentage of 0% is obtained from *the baseline*phase 1 (A-1) to the intervention phase (B) the lack of application of methods of playing *scrabble* so as not to show an increase in the ability to read the beginning of the subject Af. The percentage of 40% is obtained from the intervention phase (B) to the *baseline* phase 2 (A-2) which showed an increased ability to read the beginning through the application of a method of playing *scrabble* by 40%.

From *the* above, it can be concluded that the intervention of the application of a given method of playing *scrabble* can help improve the ability to read the beginning of the subject Af.

	Comparison of conditions	B / A-1	B / A-2
1.	Number of variables changed	1	1
2.	Changes in trend direction and its effects		
3.	Changes in the tendency of stability	Stable to variable	Variable to stable
4.	Level change	(22 - 22) = 0	(33 - 25) = +5

Calculating level changes:

Data points in	The first session on the	Change level

the *baseline*condition 1 ($A_{1)}$ in the session - the last	intervention condition (B)	
22 -	22	0
Data point on condition of intervention (B) at session - last	The first session on *the baseline* condition 2 ($A_{2)}$	Change level
33 -	25	+5

	Comparison of conditions	B / A-1	A-2 / B
5.	Percentage overlap	27%	20%

The results of data analysis showed the percentage of subjects experiencing overlap Dn 27% and 20%, it can be concluded that the intervention in the form of a method of playing *scrabble* given a pretty good influence for the improvement of reading skills beginning Dn subject, although not as good as the previous two subjects Ag and Af.

Based on the results illustrated by the graph above shows the *baseline* data 1 ($A_{1),}$ learning to read the beginning without using a method of playing *scrabble* average value obtained to 3 students tunagrahita light in the base class II in SLB YPAC Makkasar that is the subject Ag of 39.4, on the subject of Af at 34.5 and on the subject Dn of 22.7. Everything is still below the minimum criterion value determined that is the value of 60.

Implementation of the intervention (B) through the application of methods of playing *scrabble* implemented in learning to read starters showed encouraging results. Based on the results of research from three students of light tunagrahita class II at SLB YPAC Makassar there has been one student that is the subject of Ag whose reading ability beginning is above the minimum criterion that has been determined with the average value obtained is 62.4, the subject Af and Dn remain below the minimum completeness criterion that is the value of 60 with the average value obtained is 57.7 and 28.1. Nevertheless intervention results (B) has demonstrated improved reading comprehension on all three subjects.

The next phase is the *baseline* data collection 2 (A-2) after a time lag for 1 week with the intent of performing a phase control after the research subjects given intervention (B). At *baseline* phase 2 (A-2) of the three research subjects there have been two disciples tunagrahita light that is the subject of research (Ag and Af) which acquired the ability to read the beginning of the above minimum completeness criteria defined by the average value is 66.2 And 66.6. Only one student of mild tunagrahita, Dn subjects who remained unsuccessful to achieve values above the minimum completeness criterion with an average value of 32. However there has been an increase in the ability to read the beginning on the subject Dn.

The above description shows that the application of the method of playing *scrabble* can help improve student reading skills beginning in mild mental retardation base class II in SLB YPAC Makassar with varied results every subject of his research. Application of the method to play *scrabble* can make a material which is abstract can dikongkritkan, with concrete learning can stimulate students' learning motivation, which can easily absorb the subject matter provided.

Increased post-reading ability in students with mild tunagrahita after the application of scrabble play method is caused by the method of playing scrabble is fun so that students with

light tunagrahita are bound by something pleasant, with little need for thought and method of play is in accordance with the development of children. The above description is in accordance with the opinion of Ateng (Hidayatullah, 2008: 14) who argues that "in primary schools the best methods and materials of presentation are play and games, especially for the first, first and second grade".

Based on the research that has been done can be stated that the application of the method of playing *scrabble* can help improve student reading skills beginning in mild mental retardation base class II in SLB YPAC Makassar.

Recommendation

Based on the results of elitian pens conducted, it can be concluded that the ability to read the beginning of the students' light tunagrahita grade II at SLB YPAC Makassar can be improved through the method of playing srabbel.

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Factors affecting Parents' Compliance with Basic Mandatory Immunization (RA 10152) Among Selected Barangays in Iligan City

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Abstract

Childhood immunization almost guarantees protection from major diseases. However, 2.5 million deaths a year continue to cause by vaccine preventable diseases, mainly Africa and Asia children less than 5 years old (Bofarraj, 2008). The six child killer diseases identified by World Health Organization are tuberculosis, whooping cough, diphtheria, tetanus, poliomyelitis, and measles causing child mortality in many developing nations (UNICEF, 2013).

This research utilized descriptive-correlational-comparative research design, determine level of knowledge Basic Mandatory Immunization among selected barangays in Iligan City, randomly selected eighty (80) respondents, 40 mothers per barangay's. Questionnaire was based on Expanded Program on Immunization and Philippine Jurisprudence, Supreme Court Records Annotated were used as main data-gathering instrument for this study.

According to the results, 56 out of 80 respondents scored high in assessing level of knowledge about Immunization with 70%. Respondents obtained high score on the test were mostly mother's ages 21-30 years old, reached at least high school graduate. The mean score for those who have a moderate level of knowledge is 60.34-120 approximately 24 out of 80 respondents.

Pearson Correlational Coefficient showed there's low direct relationship between age, educational attainment, income per month, level of knowledge and factors affecting parents' compliance towards Basic Mandatory Immunization which means higher the age, educational attainment, income per month of the respondents, the higher the level of knowledge of Basic Mandatory Immunization. Results showed there's low inverse relationship between level of knowledge of Basic Mandatory Immunization and number of children which means greater the number of children of the respondents, the lower their level of knowledge of Basic Mandatory Immunization. This is worrying result, as those respondents with more children have lower level of knowledge of Basic Mandatory Immunization. Chi-square showed there's significant relationship between civil, employment, religion, level of knowledge and factors affecting parents' compliance towards Basic Mandatory Immunization.

Keywords: *Basic, Compliance, Factors, Immunization, Mandatory*

Introduction

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Child mortality is a challenge in many developing nations. The six child killer diseases identified by the World Health Organization (WHO) are tuberculosis, whooping cough, diphtheria, tetanus, poliomyelitis and measles. Approximately 29% of deaths in children under five are vaccine preventable. In 2011 alone, 1.5 million children died from diseases preventable by currently recommended vaccines (UNICEF, 2013).

Over 70% of unreached children live in ten countries: Afghanistan, Chad, the Democratic Republic of Congo, Ethiopia, India, Indonesia, Nigeria, Pakistan, the Philippines and South Africa. Maternal and neonatal tetanus persist as public health problems in 30 countries, mainly in Africa and Asia. It is a swift and painful killer disease that killed 58,000 newborns in 2010 alone. Measles continues to kill about 430 children each day, mainly in Africa and Asia (UNICEF, 2013).

According to the 2011 FHS, nine out of 10 (90.9%) Filipino children 12 to 23 months old have received six basic vaccinations – BCG, measles, and 3 doses each of DPT and polio vaccines – at any time before the survey. Infant mortality or death within the first year of life and under-five mortality or death before age 5 measure the impact of maternal and child health programs.

In the Philippines, 22 for every 1,000 live births die before reaching one year of age, and 30 children die before reaching 5 years old. Infant mortality and under-five mortality are lower in urban areas than in rural areas (Philippines Statistic Authority, 2013).

The Mandatory Infants and Child Health Immunization Act of 2011 (Republic Act 10152) begun and held in Metro Manila on twenty-sixth day of July, two thousand ten. It is an act providing for mandatory basic immunization services for infants and children, repealing for the purpose of Presidential Decree No. 996, as amended. It shall be given for free at any government hospitals or health centers to infants and children up to 5 years of age (Section 2, RA 10152).

Vaccination is a vital public health intervention for the prevention of communicable diseases. Its effectiveness has been demonstrated by the eradication of smallpox, the near of poliomyelitis and significant reductions in the incidence of vaccine preventable diseases (WHO, 2016). Each year, immunization averts an estimated 2-3 million deaths from eradication diphtheria, tetanus, pertussis (whooping cough) and measles - life-threatening diseases that disproportionately affect children (UNICEF, 2013).

Immunization is the process whereby a person is made immune or resistant to an infectious disease, typically by the administration of a vaccine. Vaccines stimulate the body's own immune system to protect the person against subsequent infection or disease. It works by tricking the body into believing it is experiencing a full-scale invasion by an infectious agent so that the immune system can fortify its defenses. This type of infection, however, does not cause illness, but it does cause the immune system to produce T-lymphocytes and antibodies.

Sometimes, after getting a vaccine, the imitation infection can cause minor symptoms, such as fever. Such minor symptoms are normal and should be expected as the body builds immunity. Once the imitation infection goes away, the body is left with a supply of "memory" T-lymphocytes, as well as B-lymphocytes that will remember how to recognize, fight, and neutralize disease-causing agents when they appear in the future. However, it typically takes a few weeks for the body to produce T-lymphocytes and B-lymphocytes after vaccination. Therefore, it is possible that a person who was infected with a disease just before or just after vaccination could develop symptoms and get a disease, because the vaccine has not had enough time to provide protection.

There are still incidences in our country despite the effort of decreasing or eradicating diseases. These factors are considered to be affecting the implementation of immunization.

One of these is the misconceptions of parents regarding immunization, believing in myths, and misperception about the safety of vaccines (Lieberman, 2008).

Barriers against immunization also include misinformation about vaccines, adverse effects of vaccines, vaccine-preventable diseases, and disease development after the administration of vaccines. Deficiencies in parents' knowledge about the adverse effects and contraindications of vaccines often lead to many immunization errors. Many parents believe that mild illness is associated with vaccine contraindication, therefore mild illness is considered as a reason for not giving their children up-to-date vaccinations.

To improve parents' awareness, good knowledge regarding vaccination is required. Therefore, physicians, pharmacists, nurses, and others health care providers should provide parents with correct information about the risks and benefits of vaccines. The most important factor affecting parental practice is communication between parents and the sources of information or immunization providers. Improving communication will improve parents' perceptions of the benefits and risks of vaccines (Al-lela et al., 2014)

The research aims to determine factors affecting parents' compliance with Basic Mandatory Immunization (RA 10152) as the findings obtained may serve as the basis for effective intervention.

Statement of the problem

Increasing use of Immunization is being widely used to avert the life-threatening diseases that disproportionately affect children such as the tuberculosis, whooping cough, diphtheria, tetanus, poliomyelitis, hepatitis B and measles. However, Parents still lack knowledge with regards to their children's vaccination. Thus, there is a need to assess the parents' level of knowledge, understanding, and the factors affecting their compliance towards immunization.

Objectives of the Study

The following are the specific targets that the researchers should be able to meet:

1. To determine the demographic profile of the respondents as to:

1.1 Age
1.2 Educational Attainment
1.3 Number of Children
1.4 Civil Status
1.5 Employment
1.6 Religion
1.7 Income per month

2. To determine respondent's level of knowledge and the factors affecting their compliance towards Basic Mandatory Immunization.
3. To determine if there is significant relationship between the demographic profile of the respondents and their level of knowledge and the factors affecting their compliance towards Basic Mandatory Immunization.

REVIEW OF RELATED LITERATURE AND RELATED STUDIES

Presented in this chapter are the literatures and studies- theoretical and academic- that were collated for the sake of understanding more about the study's topic.

Immunization is widely known as one of the most cost-effective public health interventions to date, saving millions of lives and protecting countless children from illness

and disability. As a direct result of immunization, polio is on the verge of eradication. Between 2000 and 2014, Deaths from Measles, a major child killer, declined by 79% worldwide and by 86% in sub-Saharan Africa (UNICEF, 2016). Each year, immunization averts an estimated 2-3 million deaths from diphtheria, tetanus, pertussis (whooping cough) and measles - life-threatening diseases that disproportionately affect children (UNICEF, 2013). But despite the successes, millions of children in developing countries – almost 20% of all children born every year – do not get the complete immunizations scheduled for their first year of life (WHO, 2009).

Immunization is an affordable means of protecting whole communities from disease and reducing poverty. Immunization coverage for the six major vaccine-preventable diseases – pertussis, childhood tuberculosis, tetanus, polio, measles and diphtheria – has risen significantly since the Expanded Programme on Immunization began in 1974 (UNICEF, 2016)

Despite these advances, many more children could be receiving the benefits of immunization. Absolute numbers of unvaccinated infants are highest in the most populous developing countries, some of which enjoy fairly high rates of immunization coverage.

Efforts to raise global immunization levels will require a strong focus on the countries where the highest numbers of unvaccinated children live – while also ensuring that the countries where children are most likely to miss out on immunization are not neglected in the search for greater global impact.

UNICEF and WHO developed the Global Vaccine Action Plan builds on the Global Immunization Vision and Strategy 2006─2015 to assist countries in expanding the reach of immunization to every eligible person, including those in age groups beyond infancy One of its goals is to increase national immunization coverage to at least 90% by 2010 and to sustain such levels through 2015. During 2014, seven of 195 countries had an estimated DTPCV3 coverage less than 50%, while 130 countries achieved at least 90% coverage with three doses of DTP containing vaccine. Of these 130 countries, 110 countries, accounting for around 40% of the global birth cohort in 2014, had sustained DTP3 coverage of at least 90 per cent during the most recent five year period 2010–2014 (UNICEF, 2016). The chief goal of GIVS is primarily to reduce illness and death due to vaccine-preventable diseases by at least two-thirds by 2015 or earlier (Otubor et al., 2015).

There are various factors that are related to parental immunization knowledge and practices that are also associated with childhood immunization compliance. These factors include education of the parents, mother's age at the time of delivery, mother's race, number of preschool children, child order, and family income. In addition, immunization providers influence parental knowledge, practices, and decisions regarding immunization of children.

The most important factor related to immunization knowledge is the level of parental education and their practices. This includes most of the information regarding immunization risks and benefits. If parents receive good information about immunization, their worries and fears about vaccination will be eased.

The effects of mothers' age on immunization knowledge and practices were estimated. Mothers' knowledge was significantly greater among the mothers who were older at the time of their child's birth. It was also indicated that race or ethnicity may contribute to inadequate knowledge, attitudes and practices of mothers.

Vaccination knowledge, attitudes and practices were correlated with family size and the number of siblings in each family. In a big household or in families with two or more children, it was found that the parents are less likely to have adequate knowledge or positive practices about the immunization of children.

The economic status of families was found to have a strong association with immunization knowledge, attitudes and practices of parents. Immunization knowledge and practices of parents could be improved and developed in many ways that could increase the level of knowledge about the risks and benefits of vaccines.

Health-care providers play an important role in child immunization. Familial knowledge and practices regarding vaccination mostly depend on vaccination providers. They serve as guidance on immunization timing and administration. In addition, immunization providers have positive effects on parental decisions related to vaccinations. They have great impact in immunization rates including access to vaccinations, knowledge about risks and benefits, maintenance of accurate vaccination records, and strategies for vaccination reminders (Al-lela et. al, 2014)

IMMUNIZATION

Immunization protects children against some of the most dangerous diseases of childhood. A child is immunized by vaccines, which are injected or given by mouth. The vaccines work by building up the child's defenses against diseases. Immunization only works if given before the disease strikes. A child who is not immunized is very likely to get measles, whooping cough and many other diseases that can kill. Children who survive these diseases are weakened and may not grow well. They may be permanently disabled. They may die later from malnutrition and other illnesses.

Early protection through immunization is critical. The immunizations in the child's first and second years are especially important. It is also essential that pregnant women are immunized against tetanus to protect themselves as well as their newborns. It is safe to immunize a child who has a minor illness or a disability or is suffering from malnutrition. It is essential for infants to get all recommended vaccines at the right time. Some vaccines require multiple doses for full protection. It is important for every child to complete the full number of these immunizations. To protect the child during and beyond the first year of life, the immunizations in the following chart are necessary. These are most effective when given at the ages specified, or as close to those ages as possible. If a child does not complete the full series of immunizations in the first two years of life, it is extremely important to have the child fully immunized as soon as possible. As new vaccines become available, more vaccines are recommended for all countries. But some vaccines are only needed in countries where certain diseases are present.

Parents and health practitioners should follow the locally recommended immunization schedule. In some countries like the Philippines, additional vaccine doses, called 'booster shots', are offered after the first year of life. These help sustain the effectiveness of the vaccines so the child is protected longer.

Many parents do not take a child to be immunized because the child has a fever, cough, cold, diarrhea, or some other illness. However, it is safe to immunize a child who has a minor illness. After an injection, the child may cry or develop a fever, a minor rash or a small sore. This is normal and shows that the vaccine is working. Children under 6 months of age should breastfeed frequently; older children should be given plenty of liquids and foods. If the child develops a high fever (over 38 degrees Celsius) the child should be taken to a trained health practitioner.

In many parts of the world, including some areas in the Philippines, mothers still give birth in unhygienic conditions. This puts both the mother and the child at risk of getting tetanus, a major killer of newborn infants. If a pregnant woman is not immunized against tetanus, and tetanus bacteria spores enter her body, her life will also be at risk .It is safe for a pregnant woman to be immunized against tetanus (UNICEF, 2013).

An act providing for mandatory basic immunization services for infants and children, repealing for the purpose presidential decree no.996 was implemented against communicable diseases. Special campaigns have been undertaken to improve further program implementation. 'Ligtas sa Tigdas at Polio'; a nationwide mass child immunization campaign for every child under the age of 5aimed for an opportunity to be protected against three highly infectious diseases: measles, rubella and polio. Every child 9 months to below 5 years old is to receive one dose of the measles/rubella vaccine while every child aged 0 to below 5 years old is to get two drops of oral polio vaccine. Receiving repeated doses of the vaccines does not pose any danger to a child.

RELATED FOREIGN STUDIES

Vaccination coverage has now reached a plateau in many developing countries, and even where good coverage has been attained; reaching children not yet vaccinated has proved difficult. Thus, there is an urgent need to find ways to increase vaccination coverage and particularly to encourage parents to have their children vaccinated (Jose et al., 2013).

A total of 1,613 children aged zero to four years participated in the study. Awareness of immunization and its importance in protecting a child against diseases was universal, although most mothers could not tell exactly against which diseases. Mothers had positive attitudes towards immunization (98%). Coverage based on the immunization card, however, was as low as 37%, indicating a discrepancy between the high level of knowledge and positive attitudes, with the observed low immunization coverage. The father's education and the mother's experience of an EPI-targeted disease in the family emerged as significant predictors of complete immunization of the child. The father's involvement and the mother's ability to cite signs of severity of EPI diseases were associated with the child's vaccination status in the high-coverage health zone. The mother's vaccine-related knowledge was a predictor of immunization status only in the low-coverage zone.

Different factors determine the complete vaccination status, depending on whether the child lives in a zone with low or high routine EPI coverage. For example, the father's involvement is associated with the child's vaccination status in the high coverage zone, but not in the low-coverage zone. Programmers and policy makers should take these factors into account when designing strategies to increase immunization coverage.

In 2013, another study conducted by Jose et. al entitled Awareness On Immunization Among Mothers of Under five Children. The objective of the study is to assess the level of knowledge of mothers on immunization with a view to develop an information booklet. The study design was non-experimental exploration survey. The sample comprised of 30 mothers of under five children, who visited Yenepoya hospital, Mangalore.

In this study highest percentage where in the age group of 20-25yrs (53.3%), with regard to religion majority (66.7%) were Muslim. The education qualification revealed highest percentage (50%). Highest percentages (46.7%) of mothers were from joint family and majority (36.7%) comes under the category of income ≤Rs.5000/month. Regarding the occupation status of mothers 50% were house wife. Knowledge of mother's exposure to mass media highest percentage (36.75%) expressed that television as a Source of information whereas (33.3%) said health professionals as a source.

A study entitled "Factors Influencing Compliance with Immunization Regimen among Mothers in Ibadan, Nigeria" stated that Occupations and religions did not constitute barriers to their participation in the scheme. Marital status shows that (92.2%) respondents were married, While 3.9% of the sample were single parent while 2.0 % were divorced and the remaining 2.0% were separated (Rahji et.al.,2013).

Otubor et. al., 2015 conducted a study entitled Assessment of Knowledge, Attitudes and Practices of Mothers in Jos North Regarding Immunization aimed to identify knowledge, attitude, and practices of mothers on immunization. As for the knowledge of mothers, the study which was an analytical epidemiology seeking for determinants of health-related outcomes which in this study is immunization- revealed that a high percentage (99.2%) of mothers reported that they have heard about immunization. About 90% also reported that they knew that vaccines are meant to prevent childhood diseases rather than cause harm to the children. This knowledge therefore accounts for the overall "good" knowledge rated among the sampled women (89.6%).

It was alarming however that only 2.6% of the mothers had excellent knowledge about all the vaccine preventable diseases (VPDs) children are immunized for. This discovery calls for targeted information, education and communication. While more than 90% knew about poliomyelitis and less than 50% knew about influenza, diphtheria and pertussis. Tetanus, tuberculosis, hepatitis and yellow fever were also readily identified by about 80% of the women.

The Attitude of mothers towards immunization resulted that only a small percentage of women (less than 3%) gave reasons for their failure in availing their children for immunization. The most popular reasons given were mother being too busy and there was a family problem. The least reasons given by mothers were they did not know the place and time for immunization, long queue and waiting time, industrial action by health workers, and lack of money.

The unavailability of vaccines as a reason for not being immunized was given by only 2.3% of women. Most of the reasons proffered by the women only show the lack of education on the part of women. If mothers were better educated on the importance of immunization and the need for it to be taken at the right time, they probably would not have excuses for not showing up for immunization.

Proper information needs to be passed on to the women. It is also important to note that Lack of money should not be an issue in Jos North because the government has provided a facility that is very reliable and the services offered in the facility is free including the vaccines given. This further stresses the fact that ignorance is a major reason for mothers not immunizing their children. Health education must be utilized to promote health protection through vaccination in order to prevent these childhood killer diseases.

Practice of mothers regarding immunization showed that in terms of showing up for immunization at the right time (within one month of the expected date), it was observed that almost 60% of mothers brought their children promptly for the first immunization- BCG.

RELATED LOCAL STUDIES

As for local studies, Philippines Statistic Authority (2013) stated that it is very important that children are immunized against the vaccine-preventable diseases: tuberculosis, poliomyelitis, diphtheria, pertussis, tetanus, hepatitis B, and measles. In addition to the six basic vaccines, the standard immunization schedule in the Philippines includes three doses of hepatitis B vaccine. The Mandatory Infants and Child Health Immunization Act of 2011 requires that all infants be given the first dose of Hepatitis B vaccine within 24 hours after birth.

Iligan City Government's department, the City Health Office (CHO) through Dr. Cherlina Cañaveral reported their accomplishments from year 2015 and the 1st Quarter of 2016 and this includes the Expanded Program Immunization. Bacillus Calmette – Guérin (BCG) with 69% and 76%; penta 3 vaccines with 54% and 125% subsequently with a remarks of the inclusion of infants not vaccinated in the previous year due to unavailability of vaccine

worldwide; Oral Polio Vaccine 3 with 67 % and 110% for 2016; Measles 81% and 75% ; Measles, Mumps & Rubella (MMR) with 65% and 78% ; Fully Immunized Child (FIC) with 81% and 68% with a remarks affected by the insufficient supply of Pentavalent vaccine worldwide in the 2nd Quarter of 2015 (City Health Office Accomplishments, 2016).

Presidential Decree 996 signed on September 16, 1976 by former President Ferdinand E. Marcos stated that Basic immunization against certain diseases shall be compulsory for infants and children below eight years of age. It was also stated on Section 4that it shall be the duty of the parents, guardian, or person having custody of the infant or child to see to it that such infant or child is presented for basic immunization services at such place and time as specified by the Department of Health.

The 1987 Constitution of the Republic of the Philippines Article 2, Section15 Stated that the state shall protect and promote the right to health of the people and instill health consciousness among them. According to the 2011 FHS, nine out of 10 (90.9%) Filipino children 12 to 23 months old have received six basic vaccinations – BCG, measles, and 3 doses each of DPT and polio vaccines – at any time before the survey.

Children in poor households (88.2%) are less likely than those in non-poor households (92.6%) to have been vaccinated against the six preventable childhood diseases. More than half (57.2%) of children age 12 to 23 months had received the first dose of Hepatitis B vaccine at birth. Children in non-poor households (64.2%) are more likely than those in poor households (46.0%) to receive the first dose of Hepatitis B vaccine at birth.

Infant mortality or death within the first year of life and under-five mortality or death before age 5 measure the impact of maternal and child health programs. In the Philippines, 22 for every 1,000 live births die before reaching one year of age, and 30 children die before reaching 5 years old. Infant mortality and under-five mortality are lower in urban areas than in rural areas.

With the rate at which infant mortality and under-five mortality are declining between 2003 to 2011 the MDG goal of reducing these rates by two-thirds can be achieved in 2015. Infant mortality rate at 22 per 1,000 live births is only 3 deaths more than the 19 deaths per 1,000 live births targeted for 2015. Under-five mortality rate at 30 per 1,000 live births is only 3.3 deaths away from the 26.7 deaths per 1,000 live births targeted for 2015.

Major reasons for missed vaccinations were sickness and long waiting time before vaccine was given: accounting for 9 (29.03%) each. During the times when vaccines were not available at the health center, 19 (61.29%) preferred to wait for it to become available. 20 respondents (64.5%) knew of other recommended vaccines which were not included in the EPI (Non-EPI) vaccines, but only 3 (9.7%) availed of it from private physicians. Of this group, 14 (70%) were willing to avail of the vaccines; 17 (85%) were thought of these vaccines as expensive; 12 (71%) were willing to have their children vaccinated; and 3 (17.64%) opted to save money first prior to vaccination.

RESEARCH METHODOLOGY

This chapter presented the methodology used in this study. It explained the research design, research setting, respondents, sampling procedure, research instruments, data gathering procedure and statistical technique.

Research Design

The researchers used descriptive-correlational-comparative design. Using this design, the researchers facilitated the identification of interrelationships in a situation and described the present level of knowledge of parents with the immunization in a particular population.

As with other descriptive studies, variables will be clearly identified and defined. In this case, the researchers used quantitative data collection. The questionnaires were designed to extract information from the respondents required in the study. The researchers used self-constructed questionnaires to the respondents. This type of data collection produced results that were easy to summarize, compare and generalize. The data was analysed using Pearson correlational coefficient and Chi-Square.

Sampling Design

The sampling method used for this study was random sampling method. Simple random sampling was the basic sampling technique where we selected a group of subjects (a sample) for study from a larger group (a population). Each individual was chosen entirely by chance and each member of the population had an equal chance of being included in the sample. 80 respondents were generally selected in Barangay Mangga Tubod and Barangay Tambacan, Iligan City. Sampling occurred by recruiting respondents to answer questionnaires given by the researchers.

Locale of the Study

The collection of data was conducted in two selected Barangays in Iligan City. These selected barangays included the Tubod and Tambacan.

Figure 2. *Tambacan and Tubod, Iligan City*
(Source: Google Map 2016)

Respondents of the Study

The respondents were parents residing in Barangay Mangga Tubod and Barangay Tambacan. There were 80 respondents per barangay subjected for answering the questionnaires.

Research Instrument and Its Validity

The self-constructed questionnaire was the main data-gathering instrument for this study. The researchers used it as a guide and modify it to make it more understandable and easy to answer. The set of questions included dichotomous questions and multiple choices where respondents were free to choose from the prepared options that fitted their response. The questionnaire was subdivided into two components. First component contained the demographic profile of the respondents which assessed their age, educational attainment, number of children, civil status, employment, religion, and income per month respectively. The second component of the questionnaire was a multiple-choice type that assessed the level of knowledge of the respondents in different components such as the general knowledge about Immunization and the factors affecting parents' compliance with Basic Mandatory Immunization.

Data Gathering Procedures

The researcher sent letter(s) of consent to respective officials of the two selected public places together with the respondents requesting them to give part to the study. The data collection was conducted on January 4, 2017 at Barangay Tambacan and March 18, 2017 at Barangay Mangga Tubod, Iligan City. The respondents was secured that the data collected was treated with full confidentiality and that it cannot be disclosed elsewhere, except for the intended study and certainly wouldn't be used against them. The questionnaires were distributed to the respondents. The total number of respondents were eighty (80); forty (40) from Tubod, Iligan City and forty (40) from Tambacan, Iligan City. To ensure a reliable

data, no question was left unanswered. When all the questionnaires were answered and filled up, encoding, summarizing and tallying of the data was done for statistical interpretation and analysis. The instrument was checked by the adviser and it was validated by a panel of experts. In terms of reliability, the research instrument used Cronbach's alpha 0.05 (5% margin of error and 95% level of accuracy) for its validity.

STATISTICAL TOOLS

The following statistical tools were used in analysing the data:

Descriptive Statistics

Includes statistical procedures that we use to describe the population. Descriptive statistics include the following:

a. **Frequency** - used to determine the number of times an answer is being chosen by the respondents.

b. **Percentage** - another way of expressing a proportion. A percentage is equal to the proportion times 100.

c. **Average Weighted Mean** - is an average computed by giving different weights to some of the individual values.

d.

Pearson correlation coefficient

This was used in relationship between two variables. Correlation coefficient was the measurement of correlation. It indicates how well the two sets of data are interconnected. Pearson correlation coefficient measured the linear dependence of two variables upon each other.

$$r = \frac{n(\Sigma xy) - (\Sigma x)(\Sigma y)}{\sqrt{[\, n\Sigma x^2 - (\Sigma x)^2 \,][\, n\Sigma y^2 - (\Sigma y)^2 \,]}}$$

Where;
r = Pearson correlation coefficient
x = Values in first set of data
y = Values in second set of data
n = Total number of values.

Chi-Square

This was used to determine if there was a significant relationship between the demographic profile of the respondents and their level of knowledge and the factors affecting their compliance towards Basic Mandatory Immunization. In this research, this was used to answer the third problem statement.

$$\chi^2 = \sum \frac{(O-E)^2}{E}$$

Where;
X2= Chi-Square
O= actual frequency or number of observations in a cell
E= expected frequency or number of observations in a cell in the theoretical distribution
∑= Symbol for "summation" the differences are cumulative

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATION

This chapter presented the summary of findings, conclusions and recommendations of the study.

Summary of findings

Researchers utilized a descriptive-correlational-comparative research design, random sampling and a self-constructive questionnaire which was based on Expanded Program on Immunization (EPI) and Philippine Jurisprudence, Supreme Court Records Annotated. Frequency and Percentage, Pearson Correlational Coefficient, and Chi-square were used to analyze the data gathered.

Results showed fifty-six (56) out of eighty (80) respondents with a percentage of seventy percent (70%) scored high in assessing their level of knowledge about Immunization. Mostly of the respondents were mother aged 21-30 years old, who graduated high school. Approximately, thirty percent (30%) of the respondents fall on moderate level of knowledge with a mean score of 60.34-120. There is a low direct relationship between age, educational attainment, and income per month and the level of knowledge and the factors affecting parents' compliance towards Basic Mandatory Immunization. A low inverse relationship between level of knowledge of Basic Mandatory Immunization and the number of children. Furthermore, there is a significant relationship between civil status, employment status, and religion and the level of knowledge and the factors affecting parents' compliance towards aforesaid law. Thus, we reject the null hypothesis.

Conclusions

Based on the findings of the study, the following conclusions have been drawn. It is concluded that demographic profile does have a strong and direct effect on the level of knowledge and the factors affecting parents' compliance towards Basic Mandatory Immunization RA (10152). Young adults who were married and who finished high school graduate are more aware of immunization. As of big household and large number of children, are less likely to have adequate knowledge regarding immunization of children.

Despite the success of Expanded Program on Immunization in Iligan City, there are still 41.25% who do not find it easy to follow immunization schedule of the said barangays. In addition to that, despite the high level of knowledge which constitutes 70% of the respondents, they still lack information regarding the indications of certain vaccines, not knowing the schedule of immunization, and poor facilities of health centers and this affects their compliance. Thus, health education and awareness must be utilized to promote health protection.

RECOMMENDATIONS

For the development of this study, the researchers have drawn the following recommendations:

- **Community/Local Government**
  - Give out pamphlets and brochures to barangay health centers, schools, public places, and clinics about the importance and benefits of Immunization.
  - Encourage barangay health centers to conduct a biannual or even annual health teaching regarding Immunization especially on mothers to prevent misconceptions and to increase their compliance.
  - Encourage health care providers/ Public Health nurses to highlight rural areas in increasing awareness, knowledge, and health teaching because they are high risk in non-compliance of immunization
- **Department of Health**
  - Establish health programs from the local government that caters not only to the mothers but as well as all women or soon to be mothers to

strengthen the prevention of child killer diseases identified by the World Health Organization.

- Allow media partnership to broadcast advertisements regarding the importance, benefits, and effects of Immunization if complied or not given attention

❖ **City Health Office**

- Do research and implement the flexibility of the schedule of immunization
- Availability of the vaccines must be established
- Provide evaluation to the mothers regarding the health workers' attitude
- Conduct workshops/seminars for health workers regarding how they communicate and manage clients

❖ **Nurses/ Healthcare Providers**

- Health care provider should provide more preventive measures and quality of management affecting parents' compliance towards immunization.
- Prompt attention and services of healthcare providers must be patient-friendly

❖ **Women/Mothers/Pregnant women**

- Participate in health educations, seminars and conferences that can provide additional information to enrich mother's attitude towards immunization

❖ **Future Researchers**

- Use a larger sample of respondents:
  - Expand the scope of the respondents in terms of upper and lower income populous.
  - Expand the scope of respondents in terms of the locale to include other public places and rural areas in Iligan City.
- Future researchers may study the relationship between the level of knowledge of RA 10152 and the demographic profile of the mothers in other rural areas in Iligan City.
- Assess thoroughly the depressed area to determine other negative factors affecting compliance on immunization.

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Development in the Practical Teaching of Khim using Lesson Study and Open Approach with Prathomsuksa 3 Students

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Abstract

The purpose of this research was to develop Khim instrument instruction by using lesson study technique and open approach with Prathomsuksa 3 students (grade 3 primary school students). The target group consisted of 38 Prathomsuksa 3 students attending the Demonstration Primary School (Suksasat) of Khon Kaen University for the second semester of the academic year 2014. The study used four teaching plans as research instruments, including 3 plans for the learning unit *Ai Teng* and 1 plan for the learning unit *Nu Malee*. Data were collected using observation, analysis of the problems faced with attempting to produce sounds from the Khim, the teacher's notes taken after class, and meetings reflecting on classroom results. The results of this study were then applied toward adjusting the teaching plans in order to solve practical problems actually faced in the classroom.

The study found that after implementing the four teaching plans, students tended to pay more attention and have more focus. They also showed eagerness to practice, to think, and to discover how to play the Khim independently, according to what they had learned. Moreover, they tended to share their ideas to help their classmates and be more observant and investigative with other groups. They were able to apply the knowledge they gained from observation to their own practice until they could play the instrument correctly. This also made the learning environment more enjoyable.

Keywords: *Khim Instruction, Lesson Study Technique, Open Approach*

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1. Introduction

As in the past, the conventional way of teaching musical instruments has involved the teacher acting as model with students imitating the teacher as closely as possible. In conventional lessons, there are no written lessons, only oral teaching and practicing. This approach of teaching in the "oral tradition," has been very effective only in cases where there are not many students.

At present, however, a teacher has more than 35 students in one classroom. He or she cannot provide enough attention to all students. This results in some students lacking an understanding of how to use the instrument. With the conventional teaching method of students imitating the teacher, and with a greater number of students and limited class time, the teacher is unable to take care of everyone sufficiently or help solve every problem. Meanwhile, some capable students are not given the opportunity to share with and help their classmates, and so they lack confidence to perform in public.

Applying lesson study technique to develop instruction is an alternative strategy which calls for the gathering of reflections from teachers in order to develop a more appropriate teaching plan that is suitable for solving problems for each class.

Meanwhile, open approach encourages students to think by using their background knowledge and understanding. Using this approach, principles are constructed for students, and they are required to analyze the knowledge and apply it to their practice. This allows the teacher to understand every student more, which is beneficial for developing subsequent lessons.

Therefore, the researchers of the present study have applied lesson study technique and open approach toward developing Thai musical instrument instruction, specifically for teaching Khim to students in Prathomsuksa 3 (grade 3 primary school students) (Unit C). This will help foster foundational skills of thinking and problem solving in the students, which they can apply to playing the Khim independently and correctly, as well as to other music.

2. Objectives

This study aims to develop and improve Khim instruction as a music subject for Unit C students using lesson study and open approach.

3. Research Methodology

This study uses educational research and development (R&D) with a focus on improving Khim instruction for Prathomsuksa 3 students by applying lesson study technique and open approach. The research procedure consisted of defining the target group, research design, variables, and research instruments; constructing the research instruments; conducting data collection and data analysis; and reporting the results and discussion.

4. Research Target Group

The research target group for this study consisted of 38 Prathomsuksa 3 students (grade 3 primary school students) (Unit C) attending the Demonstration Primary School (Suksasat) of Khon Kaen University for the second semester of the academic year 2014.

5. Research Design

This study is designed as qualitative research.

6. Variables

Independent variables: lesson study technique and open approach

Dependent variables: the pre-developed learning units and teaching plans suitable for Prathomsuksa 3 students (Unit C)

7. Research Instruments

7.1 Two learning units with teaching plans for the subject of music in the learning area of arts; these consisted of 1) 3 teaching plans from the learning unit: The Song Ai Teng and 2) 1 teaching plan from the learning unit: The Song Nu Malee.

7.2 Teacher's notes taken after class

7.3 Photographs

Conventional Teaching Plans

Unit 1: The Song Ai Teng Plan 1: Review and practice beating, switching hands, and hand movement

- Learning Objectives

1. Students know a Thai song (K)
2. Students can follow along, playing the song after the teacher shows them (P)
3. Students are confident in sharing opinions, are able to accept different opinions, and are able to work with others (A)

Unit 1: The Song Ai Teng Plan 2: Continuation of the song Ai Teng

- Learning Objectives

1. Students know a Thai song (K)
2. Students can follow along, playing the song after the teacher shows them (P)
3. Students are confident in sharing opinions, are able to accept different opinions, and are able to work with others (A)

Innovative Teaching Plans

Unit 1: The Song Ai Teng Plan 3: Having fun with Ai Teng

Situation: How to play the Khim for lines 2 and 3 of the staff

- Learning Objectives

1. Students know a Thai song (K)
2. Students are able to discover basic methods for playing the Khim (P)
3. Students are confident in sharing opinions, are able to accept different opinions, and are able to work with others (A)

- Key phrase in open approach

"Figure out basic ways to play the Khim for lines 2 and 3 of the staff."

Unit 2: Listening to the Song Nu Malee Plan 4: Play the Song Nu Malee

Situation: "How does the melody sound?"

- Learning Objectives

1. Students know a Thai song (K)
2. Students are able to discover basic methods for playing the Khim (P)
3. Students are confident in sharing opinions, are able to accept different opinions, and are able to work with others (A)

- Key phrase in open approach

"Play the Khim according to the melody you hear."

8. Construction of Research Instruments

The research instruments were constructed according to the following procedures:

8.1 Learning units and 4 teaching plans were developed for the subject of music in the learning area of arts for Prathomsuksa 3 students (Unit C) by using open approach. The researchers developed the teaching plans by following the steps below:

8.1.1 Studied the curriculum, manual, and learning standards for Prathomsuksa 3 students (Unit C) for the subject of music in the learning area of arts; the core curriculum for national education at the basic level B.E. 2551 was used as a framework for developing the learning units and suitable learning activities;

8.1.2 Studied the open approach in teaching in terms of principles and concepts and used it as a model for developing learning activities;

8.1.3 Chose the content series suitable for students in order to develop the learning units and teaching plans;

8.1.4 Analyzed the learning objectives and studied related concepts about open approach activities;

8.1.5 Synthesized and proposed open approach learning activities;

8.1.6 Met with co-researchers to plan development of the learning units and teaching plans using lesson study technique and open approach for the subject of music in the learning area of arts for Prathomsuksa 3 students (Unit C); the teaching plans consisted of 4 plans for 4 classes. Each plan was used for one class of 50 minutes and then was tested by specialists.

8.1.7 The teacher implemented the teaching plans and the researchers observed the classes, recording on an observation form and taking photographs of the class;

8.1.8 Reflected with co-researchers on the results of implementing the teaching plans in order to improve the teaching plans.

8.2 Instruments used for reflection

8.2.1 The 2 learning units consisted of 1) The song Ai Teng and 2) Listening to the Song Nu Malee

8.2.2 The class observation form was constructed by reviewing documents, analyzing information, and generating observation points related to open approach. These were checked by specialists before implementation.

8.2.3 Teacher's notes taken after class were collected.

8.2.4 Photographs were taken in the classroom.

9. Data Collection

This study develops methods for teaching music using innovative lesson study technique and open approach with Prathomsuksa 3 students (Unit C) in order to solve problems with "awareness in producing Khim sounds." The researchers included both the teacher and observers. The time used for this study was 4 classes. The process for data collecting went as follows:

9.1 The researchers noticed students' problems in producing Khim sounds and found that most students were not aware of how to produce the sounds. Examples of problems included generating the wrong note, hitting too far from the bridge, and not opening the tips of the sticks. These problems caused the Khim to sound distorted. Therefore, using open approach and creating open situations for students to think about and realize how to play the Khim with more awareness was predicted to assist students in producing a higher quality sound from the Khim.

9.2 Researchers recorded and took notes from the class and brought them up for discussion with co-researchers to reflect on the results of the implementation and to make conclusions from students' responses and achievement of the activities.

9.3 Problems faced in the study were identified in order to create a new framework for future teaching plans.

10. Data Analysis

This study aimed to develop music instruction by using innovative lesson study and open approach with Prathomsuksa 3 students. The researchers analyzed data using qualitative research methodology with a focus on analytical description. In other words, analysis was conducted on students' behaviors as they participated in the activities and in solving problems that occurred in open situations, as well as on their performance while expressing musical activities facilitated by the 2 learning units and 4 teaching plans.

11. Results and Discussion

The classroom management described in this research is another way of achieving the learning objectives which are set in the teaching plans. Innovative lesson study is suitable for teaching Khim to Prathomsuksa 3 students and could be used as a model for managing learning systems to teach music to young learners in the future.

This study found that teaching plans can be a form of teaching innovation developed from the experiences of the teacher in order to solve problems faced by students when playing the Khim. It illustrates an enhanced teaching method which allows the teacher to teach how to play Thai musical instruments to many students at the same time with limited class time.

"Being aware of how the sounds are produced," which was chosen as the topic for instruction development in this study, is a fundamental skill in learning music. Not only does it foster listening alertness, it also helps students pay attention to the musical sounds that they produce in order to make them more beautiful. This topic can also lead to improved integrated learning by developing musical skills simultaneously with personal skills, such as attention, tenderness, and care, as well as brainstorming and analysis of musical sounds. Moreover, teachers can apply this type of management for use as a model of teaching and solving problems in music classes in the future.

12. Suggestions

1) Using open approach in classroom management in order to solve problems related to learning music will be more effective if it provides more opportunities for brainstorming and teamwork, which enables students to see a variety of ways to solve problems and then adjust what they see to their own ideas.

2) Determination to produce musical sounds is an important factor and is the foundation for being a good musician in the future. Therefore, the teacher should not overlook teaching this foundation.

3) Challenging students to think in the context of an appropriate situation can activate students' interests.

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A Proposed Guideline for Development Research on Management Science Education in the Context of Reprofiling Policy in Nakhon Si Thammarat Rajabhat University

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Abstract

In the context of reprofiling policy in Nakhon Si Thammarat Rajabhat University, lecturers and staffs are also growing research activities. Additionally, the Balance Scorecard approach is prospects analyzed and implication of a balanced set of learning and growth perspectives. This is a comprehensive framework on cause and effect relations to achieve development research on management science education objectives. This paper proposes a comprehensive framework for development research on management science education in the context of reprofiling policy in Nakhon Si Thammarat Rajabhat University. A Systematic integrative review conducted a seminar and focus group discussion on management science education using a Balance Scorecard strategy map for developing and monitoring lecturers' capabilities. Five experts in sustainability crucial research were shared and encourage generating ideas and participants involved to explore and evaluate the key indicators performance. The results provides a framework to establish a strategy map for development research on management science education in the context of reprofiling policy in Nakhon Si Thammarat Rajabhat University based on four dimensions: integrative research based teaching and learning; learning and organizational growth; sustainable development; and financial supporting. Moreover, the overriding lesson to exist knowledge is the crucial of a systematic and informed approach.

Keywords: *Balance Scorecard, Comprehensive Framework, Management Science Education, Reprofiling Policy*

Introduction

Presently, the Faculty of Management Science (FMS) at Nakhon Si Thammarat Rajabhat University (NSTRU) has been engaged in Rajabhat University reprofiling policy towards a sustainable development in Thailand 4.0. The Research on Management Science Education (RMSE) gained 10 Thai industrial sectors on the 2015s in a foster to focus the development goals of tourism and hospitality management, developing community and rural economics

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awareness and academic services to society (Sookprot, 2016). Although the FMS, NSTRU administrators play a key role in advancing the successfully goals, it is the RMSE on the Thai industrial sector that will be instrumental in the success, through the way lecturers and staffs are also growing research activities, develop shared and encourage generating ideas, invest in personal learning communities, innovate, and participants involved to explore and evaluate the key indicators performance.

The outcomes of RMSE are often used to emphasize the research capability and promotion of lecturers' awareness and information on educational sustainability – e.g. focusing on promoting researcher behaviours and critical thinking, focusing on proposal preparation about tourism and hospitality management, developing community and rural economics awareness and focusing on shaping attitudes about sustainable consumption research. A predominant approach through which the discussion of lecturers and staffs are also growing research activities, sustainability and responsibility of RMSE can be engaged in Rajabhat University reprofiling policy is through their curriculum. Researchers have explored adequately approaches for doing so, ranging from the adoption of literature reviews.

The use of a more 'Balance Scorecard approach' (BSC) as a 'strategy' is instrumental driven upon and integrated across all traditional business management subject areas, such as marketing, economics, finance etc., has been proposed a comprehensive framework by Matten and Moon (2004), although recent research has highlighted the difficulties of implementing such an approach (Laszlo & Zhexembayeva, 2011). Other discusses have also argued that enhancing MSC across an integration research-based teaching and learning curriculum can gain its effectiveness with students (Sharland, Fiedler, & Menon, 2013). As a result, the outcomes even become a guideline for the teaching of other topics underlying Rajabhat University reprofiling policy.

Existing research shows that how to do increasing focus, in general across FMS, in the adoption of RMSE, the majority of this is through elective subjects and adequately research guideline, detached from the community and rural setting of FMS, thereby reflective of a comprehensive framework on cause and effect relations to achieve development research on RMSE objectives. This paper proposes a comprehensive framework for development research on management science education in the context of reprofiling policy in Nakhon Si Thammarat Rajabhat University.

Methods

Proposes of a BSC as a Comprehensive of RMSE

According to Kaplan & Norton (1997), describes the consideration of an organization into four perspectives: financial perspective, customer perspective, internal process perspective, and learning and growth perspective. The conceptual framework is analyzed and consists of a balanced set of a comprehensive framework on cause and effect relations to achieve organizational strategic goals. For this purpose, in each perspective, some questions are proposed which should be answered by strategic decisions. The goals of the four perspectives involves with each other in a cause and effect relation. The development and alignment of intangible assets induce improvements in process performance, which, in turn, drive the success for customers and shareholders.

Lawrence (2002) proposed that in each of its perspectives, the BSC divides the answers to four questions categories:

- How does the shareholders can benefit? (Financial Perspective);
- How do the customers see the company? (Customer perspective);
- What should be improved? (Perspective of internal processes);
- Is it possible to continue to improve and create value? (Learning and growth perspective).

Furthermore, the strategy map of the BSC show that hypotheses of the strategic thinking and others key performance indicator to develop a part of a critical thinking of cause and effect that connects the desired outcomes of the strategy. The application of BSC in university observed that universities, especially public universities, concentrated their strategic goals more on quality performance then in financial – e.g. by emphasizing community participation, innovation, strategic partnership and scientific research excellence in their strategies. In order to develop a BSC for RMSE in Rajabhat universities, it is essential to gain the values from BSC for higher education. To adapt the BSC for environmental education programs in universities, the four dimensions of the BSC were dimensions:

1. Dimension of financial perspective;
2. Dimension of customer perspective;
3. Dimension of internal process perspective; and
4. Dimension of learning and growth perspective.

Samples

To collect the data, researchers obtained data from 21 MSE lecturers. The 5 experts in sustainability crucial research were shared and encourage generating ideas and participants involved to explore and evaluate the key indicators performance.

Procedures and Data Collection

The research procedures conducted as shown in Figure 1.

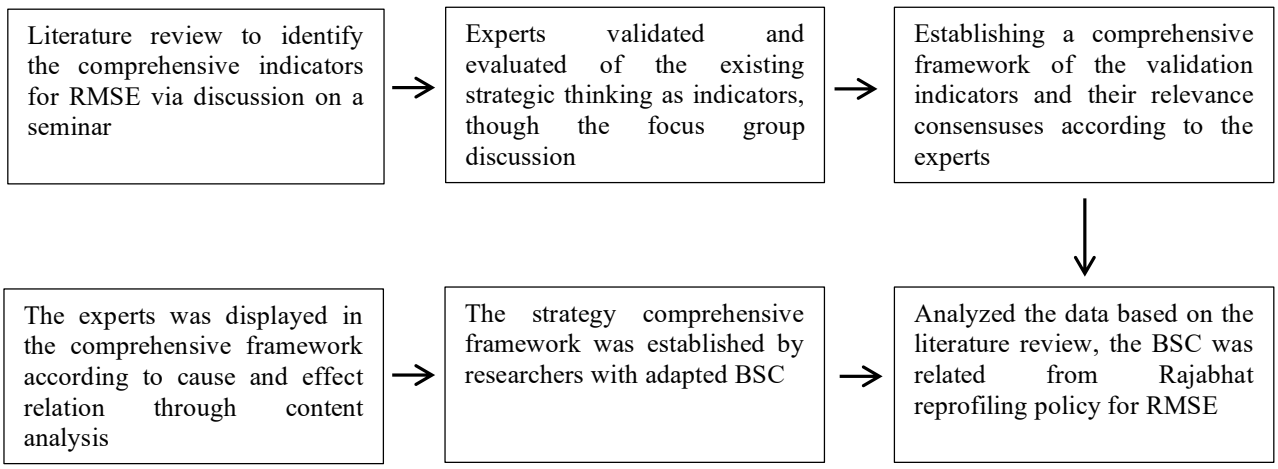


Figure 1 The research procedures conducted

Instrumentation

The existing literature based on RMSE enabled the finding of 4 indicators. A Systematic integrative review conducted a seminar and focus group discussion on management science education using a Balance Scorecard strategy map for developing and monitoring lecturers' capabilities. The indicators were applied.

Data Analysis

The literature review employed the identification of the most relevant indicators relevance this topic, consensuses done by the 5 experts. After identifying the indicators a weight of relevance to conduct, it was possible to start the process of adaptation of the RMSE to FMS at Rajabhat universities. The data was to modify the original BSC approach, five dimensions through content analysis.

Results

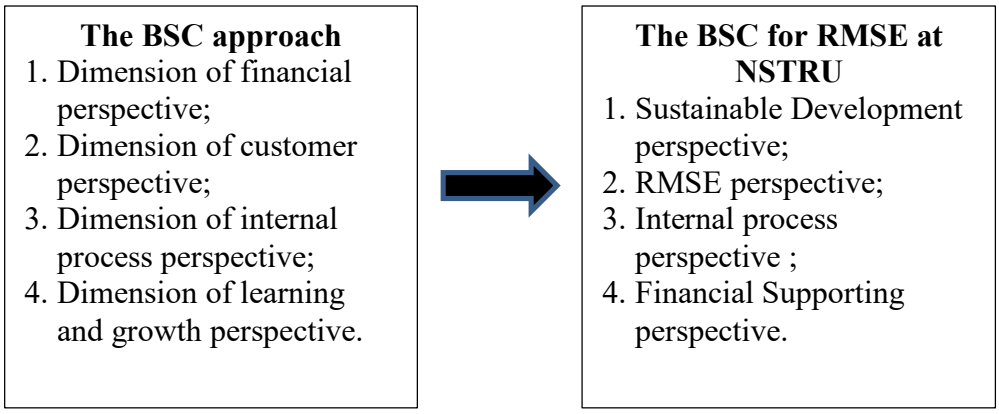
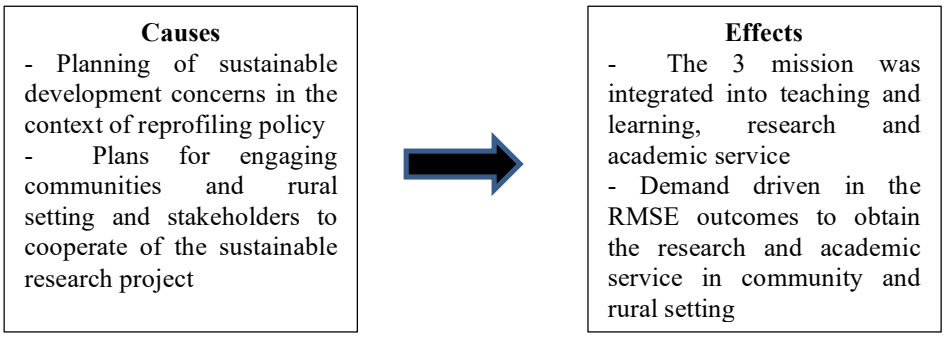


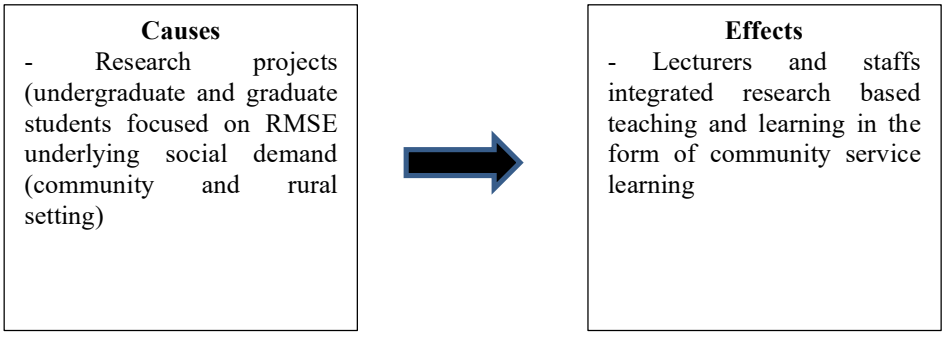
Figure 2 A comprehensive framework on cause and effect relations on RMSE

In Figure 2, the results showed that proposed guideline of a comprehensive framework for development research on management science education in the context of reprofiling policy in Nakhon Si Thammarat Rajabhat University. Based on the existing results, researchers developed a comprehensive model that identifies the factors affecting dimension of sustainable development perspective, dimension of RMSE perspective, dimension of internal process perspective, and dimension of financial supporting perspective. A comprehensive framework has two important agenda to implement of RMSE adequately approach was the crucial of a systematic and informed approach as follows as:

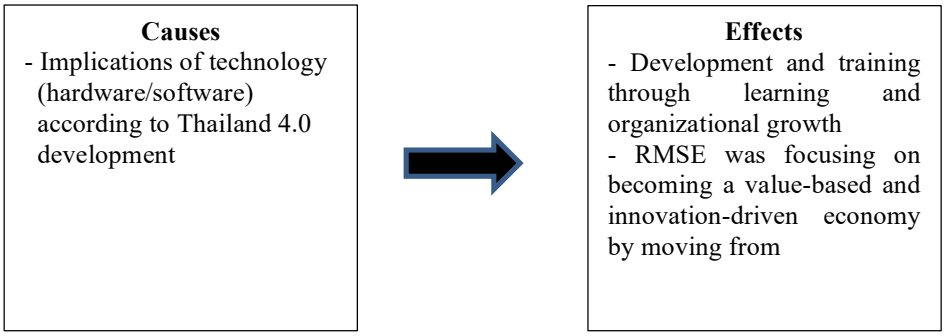
1. Dimension of Sustainable Development perspective



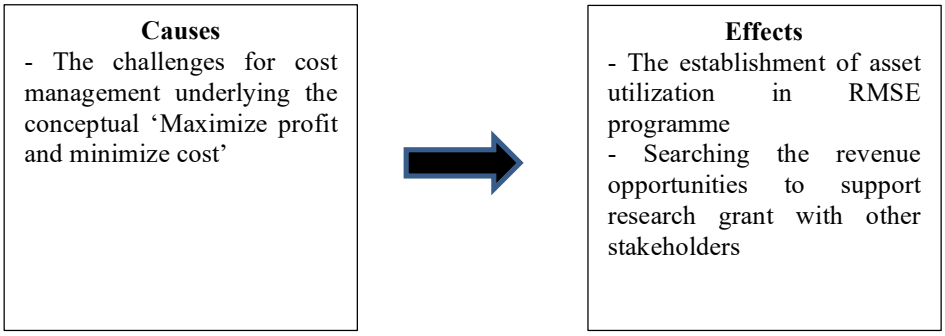
2. Dimension of RMSE perspective



3. Dimension of Internal Process perspective



4. Dimension of Financial Support perspective



Discussion

In this research, researchers proposed a comprehensive framework for development research on management science education in the context of reprofiling policy in Nakhon Si Thammarat Rajabhat University. With the development, the FMS at NSTRU could be a provides a framework to establish a strategy map to implement as a comprehensive framework, by exploring the present status of and views about RMSE in the context of reprofiling policy. As outlined in the findings, there was employed the identification of the most relevant indicators relevance this topic, consensuses done by the 5 experts. After

identifying the indicators a weight of relevance to conduct, it was possible to start the process of adaptation of the RMSE to FMS at Rajabhat universities.

Researchers also found four dimensions perspective support for RMSE and as opposed to generate a comprehensive framework, a perception among lecturers, staffs and experts that RMSE is focused upon in the management science education programme. Actually, this is indicative of an implicit focus on RMSE by faculty within the business section, through a variety of teaching, learning and assessment methods. Researchers developed a comprehensive model that identifies the factors affecting dimension of sustainable development perspective, dimension of RMSE perspective, dimension of internal process perspective, and dimension of financial supporting perspective. The findings also highlighted that while the faculty is enthusiastic about embedding RMSE. They are also wary of the potential institutional barriers which could arise either from within or outside of the framework in the context of reprofiling policy. In cause, what the findings show is that any attempt to embed RMSE requires substantive a BSC approach support, in terms of administrative, academic and resource based support, but also more importantly a determination to re-evaluate the ethos of the FMS at NSTRU. Researchers found that in the absence of the latter the former would become an inconsequential change.

Additionally, in accordance with Reay et al. (2013), we find that while the FMS were enthusiastic about RMSE from a normative perspective, they do anticipate potential institutional barriers and therefore, could potentially resist significant change. This nature of academics as professionals characterizes how they have a tendency to support institutionalized practices (Reay et al., 2013), and in instances where embedding RME equires a substantive disruption of these institutionalized practices resistance could arise even from within faculty, showcasing the autonomy of the academic profession (Sharland, Fiedler, & Menon, 2013).

Conclusion

Researchers proposed the existing research and developed a comprehensive framework that emphasizes the Balance Scorecard approach is prospects analyzed and implication of a balanced set of learning and growth perspectives. This is a comprehensive framework on cause and effect relations to achieve development research on management science education objectives. The framework of a BSC's presented in this paper is a generic practical model that can serve as a guide to develop, implement and monitor RMSE in Rajabhat universities/other universities. The practical model can guide policy and practice recommendations and interventions and be used to guide future research to produce evidence about the specific mechanisms through which each domain in the model affects RMSE and outcomes. This research is necessary for intervening at policy and organizational levels in designing necessary structures to maximize RMSE contributions to high-quality educational management.

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Investigating Effects of Training and Transfer of Automotive Mechatronics Problem Solving Skills

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Abstract

The Thai government is devising "Thailand 4.0" policy that establishes an economic model based on creativity, innovation, new technology and high-level services. This challenge rapidly-advancing technological in the workplace is problem-solving skills. Problem solving skills is a key concept used to cope with the demands of a rapidly changing world. It is the most important regarded as a cross-curricular competence (e.g., in automotive mechatronics system). This research investigated effects of training and transfer of automotive mechatronics system problem-solving skills from an 8-week field experimental training study (N = 16) and control training study (N=15) undergraduate mechanical technology students, Faculty of Industrial Technology at Nakhon Si Thammarat Rajabhat University in the semester 2/2015. Data were analyzed by using computer programming, and the level of significance was set at .05 for all tests. Investigating effects of training and transfer was tested by Analysis of CoVariance (ANCOVA). The results revealed that there were no statistically significant differences between two groups. Performance skills, the post-test scores of who had taught TAP learning strategy increased, and the conventional learning group increased to. As a result, the differences between groups were statistically significant differences. The TAP learning strategy showed that the AMSPSS Strategies had become a test domain for assessments, as in the favour of cross-curricular problem solving skills. In order to gain cognitive demands of these kinds of AMSPSS Strategies are structuring, representation and integration of information to solve engine control systems (ECS).

Keywords: *Automotive Mechatronics System, Problem Solving Skills, Training, Transfer*

Introduction

Recently, Thailand has continuously been developing its appropriateness economic model, starting from "Thailand 1.0," which focused on the agricultural sector, to light industries with "Thailand 2.0," where the country utilized workforce skills and heavy industries with a focus on domestic productions, through to "Thailand 3.0," which is focused on Thailand a production hub for exports. As a result, under Thailand 3.0, the country has faced middle-income trap development, major concerns which prompted the government to transform Thailand's economic structure to "Thailand 4.0." The goal of Thailand 4.0/Industry 4.0 is focusing on becoming a value-based and innovation-driven economy by moving forward from producing commodities to innovative products; emphasizing on promoting technology, creativity, and innovation in focused industries; and from a production-based towards a service-based economy.

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This challenge rapidly-advancing technological in the workplace is problem-solving skills. Problem solving skills is a key concept used to cope with the demands of a rapidly changing world. It is the most important regarded as a cross-curricular competence (e.g., in automotive mechatronics system). In the automotive industrial sector view, general competencies with a broad automotive mechatronics system like problem solving skills are particularly important for developing with a newly articulated (Reed, 2015). On the one hand, problem solving skills is regarded as a cross-curricular competence that is important for successful learning at institute/university, at workplace, and in different areas of professional development areas. On account of the crucial importance of Automotive Mechatronics System Problem Solving Skills Strategies (AMSPSS) is conceptualized as a cross-curricular as well as a task-specific competence. Furthermore, the AMSPSS Strategies has become a test domain for assessments, as in the favour of cross-curricular problem solving skills. In order to gain cognitive demands of these kinds of AMSPSS Strategies are structuring, representation and integration of information to solve engine control systems (ECS).

Theoretical Background

This research encourages the development of undergraduate mechanical technology students' ability to think critically to enhance students' abilities to logical assess and formative interventions to impact the AMPSS Strategies. Therefore, problem-solving skills have been developed to be better in students who have conducted instruction with other learning strategies – (e.g., case-based reasoning, problem-based learning, inquiry-based learning, and etc.) relative to these who taught by lecturer. Researcher has fostered in the increase of students' critical thinking and problem-solving skills, which are combined regard as a cross-curricular competence to solve engine control systems (ECS).

In analytical problems of ECS, all information articulated to solve the problem is explicitly stated or can be inferred from the given problem situation (e.g., camshaft positioning sensor allocating engine to measure engine ignition timing control when all constraints like fuel injection quantity, air fuel ratio, engine speed, road load capacity, etc., are given). Analytical problem solving can thus be seen as the reasoned application of existing knowledge to solve the problems. In order to accomplishment cross-curricular problem solving skills requires a person to (1) understand, (2) characterize, (3) represent and (4) solve the problem, (5) reflect and (6) communicate the problem solution. Descriptions of the AMSPSS, Strategies which is the theoretical basis for the assessment, comprise comparable steps: (1) starting with a real-world situation problems, (2) organizing it according to automotive mechatronics system concepts as thinking skills, (3) gradually trimming away the real-world situation through processes as analytical skills, (4) solving the automotive mechatronics system solution in terms of the real-world situation as performing skills (Sudsomboon, 2010a; 2010b; Sudsomboon & Hemwat, 2012). The implications of training and transfer of automotive mechatronics system problem-solving skills strategy (TAP) learning strategy is discussed.

In summary, the cross-curricular problem solving skills and AMSPSS strategies becomes evident when one looks at the cognitive resources required to enhance a TAP learning strategy to solve ECS problem tasks. Transfer of learning is an important goal of education. The term is somewhat ambiguous transfer can be defined as an effect of prior learning on new learning and problem solving (Mayer, 2008). The purpose of this research was to investigate effects of training and transfer of automotive mechatronics system problem-

solving skills. Investigating aspects of this hypothesis by addressing this research question: What was the influence of TAP learning strategy?

Methods

Design

A nonequivalent control group pretest–posttest design was used in this research. The quasi-experimental study was conducted. The research compared investigated the effects of instruction using of training and transfer of automotive mechatronics system problem-solving skills strategies versus traditional education in engine control systems.

Participants

Participants separated in two groups, consisted of third year undergraduate mechanical technology students, Faculty of Industrial Technology at Nakhon Si Thammarat Rajabhat University in the semester 2/2015 to prevent contamination. None of the students in either group had been exposed to TAP learning strategy. The research given effect size estimate between the TAP learning strategy and conventional learning strategy is d=1.0 (one standard deviation apart). To design a study at the recommended level of 80% power, for two-tailed $\alpha = .05$, (Cohen's d = 1.0), and Power = .75, (N = 30 for between groups and N = 15 for within groups). As a result, participants were done by 16 undergraduate mechanical technology students in the TAP learning strategy group and 15 participants in the conventional learning group. In summary, a power analysis determined that the required sample size was 15 per group (Cohen, 1988).

Instrumentation

The AMPSS strategies was developed by Sudsomboon (2014, 2016) and Nissan Motors Service Manual to assess dimensions of critical thinking of undergraduate mechanical technology students. The scale has 16 items in five sub-scales. Cronbach's alpha was found to be .85 and in our study a Cronbach's alpha was .89. This scale is scored on a 5-point Likert-type scale of 1 to 5 (1 = absolutely do not agree to 5 = absolutely agree). Total scores have a range from 1 to 50.

Procedure

An 8-week field experimental training study (N = 16) and control training study (N=15) undergraduate mechanical technology students, Faculty of Industrial Technology at Nakhon Si Thammarat Rajabhat University in the semester 2/2015 was conducted. Training and Transfer procedure divided into 2 groups (the TAP learning strategy and conventional learning groups).

The importance of these common components of cross-curricular competence and engine control system problem solving is emphasize supported by Sudsomboon (2014, 2016) and Nissan Motors, who conducted an item-demand analysis of the test items and scales. These identified problem-solving skills, analytical thinking skills, and performing skills as important components of both domains. Interestingly, cross-curricular problem solving items turned out to be camshaft positioning sensor allocating engine to measure engine ignition

timing control items in terms of the TAP learning strategy as well as dealing with constraints and knowledge of procedures.

Data Collection

For the TAP learning strategy group, there were 16 students assigned to 5 TAP learning strategy groups; each group consisted of 3 students. The TAP learning strategy group worked 32 h with 2 learning packages (camshaft position sensor signal processing inspection and engine ignition timing control signal processing inspection) developed by researcher. Each the TAP learning strategy group was 4 h per week for 8 weeks and was facilitated by a faculty member who taught automotive technology subject with undergraduate mechanical technology students, Faculty of Industrial Technology at Nakhon Si Thammarat Rajabhat University. The 15 students assigned to the conventional learning group (lecture group received didactic lectures for 4 h per week for 8 weeks on the same content as that of the TAP learning strategy group.

Data analysis
Data were analyzed by using computer programming, and the level of significance was set at .05 for all tests. Investigating effects of training and transfer was tested by Analysis of CoVariance (ANCOVA).

Results

What was the influence of TAP learning strategy towards the engine control system problems?

Table 1 The pre-test of ANCOVA for problem-solving skills, analytical thinking skills, and performing skills between the TAP learning strategy (N = 16) and conventional learning groups (N = 15)

Variables	Pre-test				Post-test				*F	*P*
	TAP		Control		TAP		Control			
	Mean	SD	Mean	SD	Mean	SD	Mean	SD		
Problem-solving skills	20.63	4.66	21.18	4.94	25.78	4.19	24.91	4.37	2.469	.113
Analytical thinking skills	33.52	6.08	34.94	6.55	38.07	5.04	36.76	5.82	1.613	.608
Performance skills	36.07	8.91	35.56	8.72	41.35	7.21	38.27	7.55	.705	.004

Note: * F is directly measured by the time group interaction term in the repeated measures ANOVA. The adjustment is the pre-test score in ANCOVA

In Table 1, the results revealed that comparisons of the scores between the two groups, ANCOVA, using pre-test scores as the covariates was presented. Problem-solving skills scores increased 5.15 points for students after TAP learning strategy and increased 3.73 points for students in the conventional learning group. This difference was not statistically significant (F = 2.469, df = 1, p = .113). Analytical thinking skills scores in the TAP learning strategy increased to 4.55, however scores in the conventional learning group increased to 1.82. There were no statistically significant differences between two groups (F = 1.613, df =

1, p = .608). Performance skills, the post-test scores of who had taught TAP learning strategy increased to 5.28, and the conventional learning group increased to 2.71. As a result, the differences between groups were statistically significant differences (F = .705, df = 1, p = .004).

Discussion

The research investigated effects of training and transfer of automotive mechatronics system problem-solving skills from an 8-week field experimental training study. In this research, the transfer in cross-curricular problem solving of research question, the overall of training showed that performance skills, the post-test scores had the differences between groups were statistically significant differences. Therefore, according to accomplishment cross-curricular problem solving skills requires a person to (1) understand, (2) characterize, (3) represent and (4) solve the problem, (5) reflect and (6) communicate the problem solution (Sudsomboon, 2010a; 2010b; Sudsomboon & Hemwat, 2012). There is no evidence to prove the theory for transfer. In a weaker interpretation, the interaction between group and prior cross-curricular problem solving competence is a prerequisite of the corresponding interaction effect.

In other words, we found effects of transfer on analytical problems of ECS, all information articulated to solve the problem is explicitly stated or can be inferred from the given problem situation (National Automotive Technicians Education Foundation, 2013; Reed, 2013; Sudsomboon, 2014, 2016; Sudsomboon et.al., 2017) that are similarly according to effects of transfer on cross-curricular problem solving. The statistical were not statistically significant differences of the interaction between group and prior cross-curricular in the problem-solving skills and analytical thinking skills. Students given a short scheme of 7 parts improved their solving-problem ability more, relative to students provided a long segmentation scheme of four parts (Jonassen & Hung, 2006).

Descriptions of the AMSPSS, Strategies which is the theoretical basis for the assessment, comprise comparable steps: (1) starting with a real-world situation problems, (2) organizing it according to automotive mechatronics system concepts as thinking skills, (3) gradually trimming away the real-world situation through processes as analytical skills, (4) solving the automotive mechatronics system solution in terms of the real-world situation as performing skills. A short case segmentation scheme helps students efficiently solve problems. In the present research, the TAP learning strategy employed long schemes. It is recommended that future would be formatted in shorter segments Anastassova & Burkhardt, 2009). .

The TAP learning strategy effects mean that the success of a treatment is not the same for all learners within a group because the treatment is more or less suitable for specific individuals or groups of individuals contingent on their aptitude or ability. In our study TAP learning strategy indicated positive cognitive training effects for enhanced students' use of other automotive mechatronics system problem solving skills, analytical skills, and performing skills (Mayer, 2008).

Conclusion

The TAP learning strategy effects has implications for what expertise is; how problem solving in any domain ought to be conducted; and how it should be researched; how problem solving processes are best conducted; and so on. Here the discussion is confined to some brief

indicative remarks. The TAP learning strategy showed that the AMSPSS Strategies had become a test domain for assessments, as in the favour of cross-curricular problem solving skills. In order to gain cognitive demands of these kinds of AMSPSS Strategies are structuring, representation and integration of information to solve engine control systems (ECS). However, each of these latter technologies presents new opportunities to capture and/or use possibilities to enhance the problem solving process, especially in group solving processes. The capacity of this new TAP learning strategy is to enhance problem solving process in other ways than just partial proposal selection can be systematically method possibilities.

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Developing Students' Preparedness for Disaster Risk Management through an Improvised Warning Device in Measuring Rainfall

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Abstract

This study is an assessment and utilization of improvised warning device in developing students' preparedness on disaster risk management. The study aimed to examine the performance of the respondents through learning activities. The improvised warning device was fully functional as rated by the experts. A sample of 36 Grade 8 students with 15 male and 21 female was used in this study. Working in teams, students make decision and share information about typhoon behavior and preparedness for disaster risk management. Results showed that the students developed their preparedness on disaster risk management, analyzed behavior of typhoons and potential risk and understand weather pattern. Thus students learned to measure rainfall using the improvised warning device. Students also have learned the use of the device as all groups had shown exemplary performance. The students perceived that the activities made them become knowledgeable of disaster risk management. Based on the results of the study, the researcher recommends utilizing the improvised warning device in laboratory activity in teaching Typhoon: Awareness and Preparation.

Keywords: *Disaster Risk Mangament, Improvised Warning Device, Rain gauge instrument*

Introduction

For an effective teaching and a more concrete learning process, a school must provide not only the discussion input but also the equipment for the laboratory activities that are aligned to the K-12 curriculum. However, classrooms of most public schools lack these materials to promote hands-on learning in science. As a result, the learners only grasp the procedural knowledge but not the experience. The use of improvised materials has been a great help to the teacher in making science concepts comprehensible to students. This pertains to the use of alternative materials producing a device to facilitate learning whenever the lack of standard materials and teaching aid come along the way. This study is guided with the questions on the functionality of the improvised warning device, ratings and recommendations of the experts, utilization of the improvised warning device as a learning material and the perceptions of the students on the use of improvised warning device in laboratory activities. This is limited to the improvised rain gauge instrument as an early flood warning device and is defined in implementing it as a learning material in developing

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students' preparedness and disaster risk management for students in Lanao del Norte National Comprehensive High School located in Baroy, Lanao del Norte.

Active learning is perceived as a radical change from traditional instruction which refers to the robust research finding that learning is more durable and lasting when students are cognitively engaged in the learning process (Lynch, 2016). A study conducted by Freeman et al. (2013) compares student performance in undergraduate science, technology, engineering, and mathematics (STEM) courses under traditional lecturing versus active learning which indicate active learning increases examination performance by just under half a SD and that lecturing increases failure rates by 55% meaning that on average, student performances increased with active learning compared with lecturing. Students in traditional lecture courses are 1.5 times more likely to fail than students in courses with active learning. Same result was obtained by Walker & Baepler (2014) with the two controlled quasi-experimental studies conducted in order to examine the contribution of Active Learning Classrooms to students' academic engagement and learning outcomes. After the controlling for all relevant demographic and aptitude related variables, the Active Learning Classroom improved students' engagement in the learning process. It manifests the students' potentiality to outperform final grade expectations, resulting in improved learning outcomes; and affects teaching-learning activities even when the instructor attempted to hold these activities constant.

The act of improvising and building a device from unusual components in an ad-hoc fashion is termed as Improvisation. This is the use of alternative materials to produce a device to facilitate learning whenever there is a lack of standard materials and teaching aids to support learning. The use of improvised materials has been a great help to teacher to make science concepts comprehensible to students. (Otor,Ogbeba, & Ityo, 2015). According to Iji, Ogbole, and Uka (2014) Improvised instructional materials enlivened and brought about competitiveness to students to learn as stimulated. This provides total involvement, enthusiasm, excitement and enjoyment of the lesson. Utilization of improvised instructional material improves students' achievement and enhances students' cognitive, psychomotor and affective domain. Improvised material as a teaching aid in a science class supplements teachers' oral explanation with students' visible experiences. It enables students to actively involve intellectually, physically and perceptually in the learning process. Concrete experience help them developed their intellect showing variation of students performance due to the use improvised material (Mboto, Udo, & Stephen 2011).

Research Design

This is a descriptive research which determines the functionality of the improvised warning device in determining the development of students' preparedness on disaster risk management. This study also includes qualitative data in utilizing the improvised warning device in science classroom which were obtained from the respondents using questionnaires. Quantitative data, on the other hand, were obtained from the results in testing the functionality of the warning device.

Subjects and Locale of the Study

This study was conducted in one of the public high schools in Lanao del Norte. There were 36 student respondents enrolled during S.Y. 2016-2017 selected through purposive sampling,

Data Gathering Procedure

The procedure of gathering data consisted of: a) Construction of the improvised warning device; b) Testing the device's functionalities; c) Experts' evaluation of the device; d) Development of learning activity and; e) Implementation phase. Results have shown that the improvised warning device was efficient and effective during the test on the actual scenario and the implementation period. Each component; rainfall measuring component, alarm system, and power supply system were tested and rated as fully functional by the experts'. The improvised warning device was utilized as a learning material by the respondents. It helps students' to developed preparedness and disaster risk management in their laboratory activity allowing them to have hands-on experience with the device.

The improvised warning device was adapted from the rain gauge commercially found online. The researchers improvised the device that is capable to compete with the available rain gauge in the market when it comes to its basic functions as well as on its economic significance. The researchers added some features like semi-automated water level sensor in the inner measuring tube, water-level light indicators, sound alarm, and power supply system comprised with 12V rechargeable battery and solar panel with the aid of the charge controller.

All parts of the rain gauge were adapted from the 8-inch non-recording standard rain gauge. The alarm system was constructed with the help of the experts. An electrical circuit was designed as reference. It consisted three main parts namely: water level sensors, water-level light indicators and, sound alarm. The power supply system consisted also three main parts and these are solar panel, solar charge controller and rechargeable battery. The system was planned by the researchers to be not dependent on the commercial electric power supply and become available all the time especially during catastrophe when power outage is highly possible. To evaluate all components of the improvised device, the researchers made a rating scale. The device's components made as categories in the scale were divided into three main groups: rainfall measurement, alarm system and power supply system. Also, there were descriptions provided that corresponds to the degree of choice of the evaluator. After the initial testing of the device, revision of the design, as well as its evaluation from experts a test on actual scenario was conducted. For a day, the rain gauge was mounted on field with several considerations like surrounding vegetation or establishments. The researchers recorded amount of rainfall/precipitation as well the response of the alarm system and the condition of the power supply system.

Laboratory activity, user manual, and assessment tools, constructed and used by the researchers during the implementation phase went through critiquing and evaluating process by the science experts. In choosing the Content Standard; it was the targeted K to 12 Curriculum with a learning competency: "Demonstrate understanding of formations of typhoon". Activities included in the designed laboratory activity were based on already-existing similar topics. These were adapted and compiled to come up with a laboratory activity which fits the topic. All instructions needed for the operation of the improvised were

stated in the manual such as system setup and operating the system. Also, safety tips before, during and after were provided in the manual. Aside from these, the rationale of the study was given as an introductory part of the manual. Assessment were created to guide the researchers as they rate performances of the students like behaviour during the implementation phase. Also, these tools are used to know the perception of the students towards the activities provided by the researchers. Some assessment tools made were rubrics and rating scale with corresponding interpretation on the results after being tallied.

The instructional materials and the device were prepared ahead the implementation phase. On the first day, the researchers gave a lesson discussion. On the second day, the discussion continued and the device with its parts, functionalities and manual was also introduced to the students. On the third day, group activity was conducted where the students had themselves grouped and each member was given a task. After the group activity, learning log, self-assessment and peer assessment were given to the students to be answered.

Findings and Conclusions

The improvised warning device (see figure 1a) has three main parts. (1) Rainfall Measuring Component measures the rainfall that the device receives. The inner measuring tube can hold up to 2.5 inches of water measurement or approximately 103 cubic inches of water. When water level reaches more than that level, the overflow can receives spilled water which can contain water volume at approximately 19,302 cubic inches of water. (2) Alarm system water level sensors, water-level light indicators and buzzer. Water level sensors are placed inside the inner measuring tube. As water reaches each level of the sensors, it triggers the light indicators to light up. (3) Power supply system is composed of 10w/12v solar panel, 12v7.2Ah GLA Rechargeable battery and solar charge controller. All measurements specified by the researchers were met. Also, water level in the measuring tube can be monitored easily using simple circuit. As shown in figure 1b, the overall circuit diagram shows different parts of the device like transistors, LEDs, buzzer and resistors. From the designed electrical circuit, 5 wires were placed inside the tube. Four of these wires were for the sensors. 330 ohms resistors were used to limit the current that goes into the loads. The wire from the base of the transistor was placed at the level to be indicated. Five more other circuits were connected in the actual device that indicated additional loads. Each wire indicated the following levels: 7.5 mm, 10 mm, 15 mm, 16 mm, 25 mm, 30 mm, 31 mm 32 mm and 34 mm.

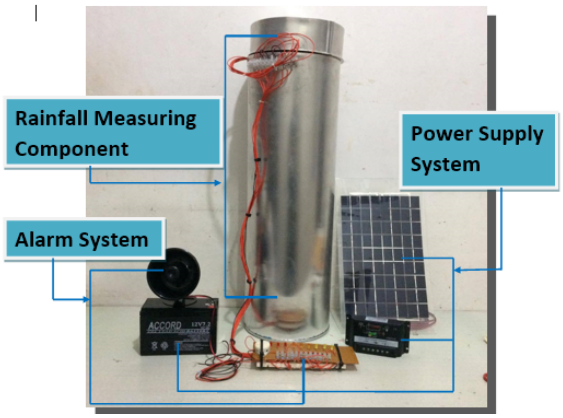

Figure 1a. Actual Improvised Warning Device

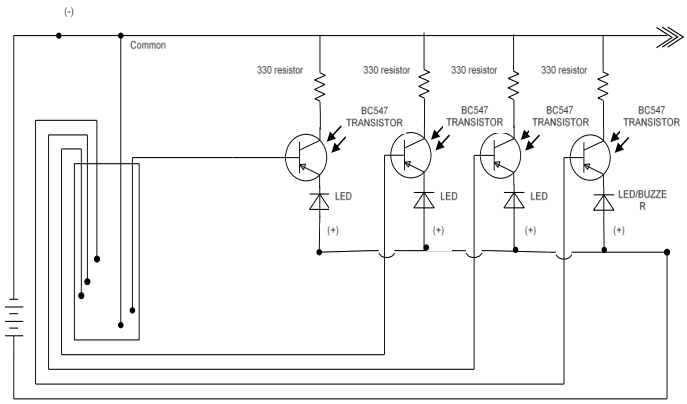

Figure 1b. Overall Electrical Diagram

This initial test was conducted to test if the two different containers, container 1 and 2, placed near the rain gauge during rain. Based on the data gathered, the improvised warning device yielded similar results with the two different containers. The first container collected 286.5 〖cm〗^3 volume of water. The second container had 287 〖cm〗^3 volume of water. Similarly, the rain gauge also collected 286 〖cm〗^3 volume of water in its overflow can. The depth of the water collected was measured using a ruler which resulted into data of 0.90 cm approximately for all three containers. A very small amount of differences have been recorded. From the overflow can, water from each container was individually poured into the inner measuring tube to test whether the measuring tube records the same data with the overflow can. All containers had the same data for the volume of water which is 286, approximately. After computing the volume in the measuring tube, the depth was also recorded using a calibrated dipstick which gathered figures 12, 12.5 and 12 for the three containers. The discrepancy of figures was accounted for the pouring/transferring of water from one container to another. Also, rounding off of figures has been done. From these data, the rain gauge had the same amount rainfall collection as with the two other container.

Table 1. Test of Rainfall Measurement Accuracy

Container No.	Volume of Water in Overflow Can (cm3)	Water Level Measurement (cm)	Volume of Water in Measuring Tube (cm3)	Calibrated Water Level Measurement (mm)
1	286.5	0.90	286	12
2	287	0.90	286	12.5
3 (Rain Gauge)	286	0.90	286	12

Researchers had a 1-day data recording. As shown in table 1, the 24-hour precipitation of the day was recorded along with the response of the alarm system on the precipitation level and the capacity of power supply system During the test, the solar panel, solar charge controller and battery worked well. These components were mounted on ideal locations in the testing site. Conditions like exposure of solar panel to sunlight and appropriate temperature for the battery and solar charge controller were considered during the test. The device collected a total of 12.5 mm of water from the rain which started at about 5 in the afternoon up to 10 in the evening. The water level triggered up to the second yellow LED. However, amount of precipitation collected during the test on actual scenario was not significant enough to trigger sensors to light up all LEDs including the buzzer.

Table 2. Actual Precipitation Measurement Test

	Precipitation Level (mm)			Rain Category/ Remarks	Color of the LED Indicated
	8 AM-5PM	5PM-8AM	Total (24 hrs)		
Measurement	0	12.5	12.5	Moderate Rain/ Lasted for 4-5 hrs.	Yellow

Furthermore, the researchers carefully simulated rainfall measurement to support the data. The simulation was done in a controlled environment where conditions like wind disturbance and vegetation within an area were eliminated.

Table 3. Simulated Precipitation Measurement Test

No. of Trial	Simulated Precipitation		Color of the LED Indicated	Sound Alarm
	Prepared Water Volume (Graduated Cylinder)	Rain Gauge Measurement (using calibrated dipstick)		
1	115 ml	7.5 mm	Yellow	No
2	150 ml	10 mm	Yellow	No
3	210 ml	25 mm	Orange	No
4	420 ml	32 mm	Red	No
5	650 ml	34 mm	Red	Yes

The researchers prepared 5 different measurements of water using beakers. The measurements prepared were based on the measurements of the sensors also which was set to trigger. As each beaker was poured into the measuring tube, the alarm system was responsive where all measured simulated precipitation triggered the sensors to light up LED indicators. Water volumes 115 ml and 150 ml had a measurement of 7.5 and 10 mm respectively. Yellow was the color of the LED indicated. 210 ml water volume had a measurement of 25 mm with orange indicated color. Last volumes of water, 420 ml and 650 ml, recorded measurements equal to 32 mm and 34 mm respectively, with red indicated color. However, only the 34 mm measurement triggered the sound alarm to buzz. These data presents that the device was functional, in all components, as tested in simulated precipitation.The device was referred to the experts. Using a rating scale made by the researchers, the experts rated each material of the components of the device. Based on table 4, all materials were rated as fully functional. However, comments and suggestion were also solicited from them to support the claim.

Table 4. Experts' Evaluation of the Improvised Warning Device

Component		Evaluator				Average	Description
		ET1	ET2	ET3	ET4		
Rainfall Measurement	a. Calibrated Dipstick	3	3	2	2	2.5	Functional
	b. Internal Measuring Tube	2	3	2	3	2.5	Functional
Alarm System	a. Sound Alarm	3	2	3	2	2.5	Functional
	b. Light Alarm	3	4	2	4	2.35	Functional
	c. Water Level Sensors	3	3	2	3	2.75	Functional
Power Supply System	a. Solar Panel	4	4	4	4	4	Fully Functional
	b. 12V Chargeable Battery	3	2	3	2	2.5	Functional
	c. Solar Charge Controller	4	4	4	4	4	Fully Functional

Below is a list of their comments and suggestions.

Comments/Suggestions of Experts of the improvised device

Calibrated Dipstick

"Not precise measurement" (ET1, ET3)
"Use a graduated cylinder in measuring in fluid both part" (ET2)
"Use a graduated cylinder to gather accurate measurement" (ET4)

Water level Sensors

"Functional but needs improvement—use proper sensor" (ET1)
"It is okay but next time try to use a true level sensor" (ET2, ET3)

12V Rechargeable Battery

"It is not compatible with other equipment/components" (ET1, ET2, ET3, ET4)

As shown in figure 2, researchers followed the suggestions given by the evaluators after their rating. Too much supply could bust the LEDs, therefore as a solution; an 18 watts DC/DC converter was bought from online store to convert power from the 12V GLA Battery to 9V, since the load requires only 9V. Using a lower power supply will result into a weaker buzzing sound

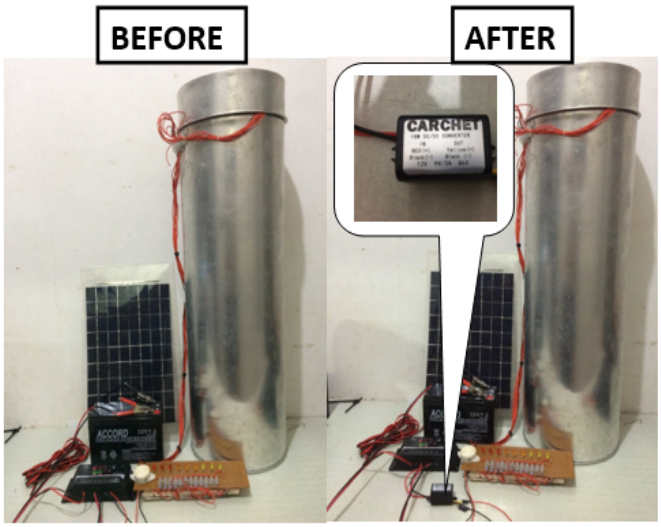

Figure 2. Before and After the Experts Suggestion

Table 3 presents the result of all six (6) groups obtaining higher scores than the 75% passing score as most of the groups have acquired above 50 scores out of 57 total items. One of the groups, group 4, almost attained the highest possible score. Based on the rating scale for the group's activity, all groups had shown excellent performances which indicated that the students have learned measuring the rainfall using the improvised warning device. This study was supported by Iji, et. al (2014) that utilization of improvised instructional material improves students' achievement and enhances students' cognitive, psychomotor and affective domain. Improvised material as a teaching aid in a science class supplements teachers' oral explanation with students' visible experiences. Results showed that achievement scores of students have better results with the use of improvised material. Concrete experience help them developed their intellect showing variation of students performance due to the use improvised material (Mboto, Udo, & Stephen 2011)

Table 3. Groups' Scores in the Activity

Group No.	Score	Description
G1	47	Excellent
G2	50	Excellent
G3	51	Excellent
G4	55	Excellent
G5	51	Excellent
G6	52	Excellent

Students' Perceptions on the use of the Improvised Warning Device

The researchers asked the students their perception on the use of the device through learning log questions. The following statements are the answers of the students on the learning log and were grouped according to the similarities of their answers.

Learned to measure rainfall using improvised warning device.

"I learned how to use the improvised device in measuring the amount of rainfall an area receives in a given time period". ***(S2)***

"I learned how to know the measurement of water level, to operate the device and to know the color of the LED". ***(S9).***

"I learned that water levels have corresponding LED light and they can be measured using the rain gauge". ***(S11)***

"What I learned from the activity, I was able to know how the rain gauge work and how it makes things easier to identify the possibility of the rainfall, since it was improvised". ***(S16)***

"I learn from the activity is how to detect flood and how to use the rain gauge for us to know the level of water". ***(S17)***

"In this activity, I learned how to use the improvise device and how it can us to be alert whenever there is a typhoon or a normal rain and the advantages and disadvantaged of the device" ***(S25)***

"I have learned in this activity that rain gauge helps us measure the amount of water that falls in an area". ***(S26)***

"I learn from this activity is when the color of the LED is yellow, flooding is possible. If it is orange, flooding is threatening. And if it is red, serious flooding is expected in low lying areas". ***(S27)***

"It is useful because it gives us knowledge about measuring the amount of rain that falls in a certain period of time". ***(S29)***

"I've learned that there are different types of color of height that is used by the PAGASA then the parts of the rain gauge and how to operate it correctly". ***(S4)(S8)***

"What I learn on the activity is that the rain gauge is an instrument which measures the amount of rainfall a month, week or even a day". ***(S3)(S5)(S16)***

Analyzed behaviors of typhoons and its potential risks.

"It helps us on understanding on how we can be ready or it can give us information during the disasters that are coming." ***(S3)***

"The device will be helpful to a student like me, well to be ready and to share the knowledge I mentally receive". ***(S8)***

"It gives more knowledge about the weather and it will guide them on reducing or eliminating risks and casualties when disastrous typhoon and flood is about to strike". ***(S10)***

"For a student like me, the device is helpful for me to learn how to use the device and gives me more knowledge on how to understand weather patterns". ***(S12)***

"As a student, it will help me by checking the situation of the rain". ***(S16)***

"For me, the device is very helpful as a student like me because we can use the rain gauge easily for our lesson". ***(S35)***

Developed students' preparedness on disaster risk management

"The advantages of this device is to measure, if flooding is possible or not in the exact where rainfall happens. This device may also help us to be ready of what will be happening before the typhoon". ***(S4)***

"I learned about how to use the rain gauge and how to measure the amount of rainfall in simplest way and how it will guide us on reducing or eliminating risks and casualties when disastrous typhoon and flood is about to strike or to come". ***(S5)***

*"I learned that using this device can really help me when there is a typhoon coming, in fact it can raise awareness to everyone".****(S14)***

"The improvised device makes people alert and prepared specially in low lying areas". ***(S12)***

"I learned how to be prepared when there is flood and when to evacuate". ***(S21) (S28)***

*"The device is helpful for us (students) to educate such a young age about the rain gauge and to know the different level of a typhoon and to help other people to be aware and alert for such natural disasters like typhoon".****(S33)***

"This device will let you know about the flood possibility if it is possible to flood, if flood is a threat or if serious flooding is expected". ***(S34)***

Based on the answers of the students on the learning log, they were able learn how to use the improvised warning device and understand more the weather system in the Philippines which includes the topics; Typhoon formation and why Philippines is prone to typhoons. They also learned that through the device, they can monitor rainfall intensity in their locality over a short or an extended period of time. With the help of the PAGASA color-coded rainfall advisory, the device could send them signal if flood is possible in their area through the alarm system of the warning device. With these findings, it can be concluded that students have become knowledgeable of disaster risk reduction and management with regards to flood and typhoon, and have learned the different responses to these disasters based on the warning device.

CONCLUSIONS

After the implementation of improvised warning device in developing students' preparedness and disaster risk management, the researchers come up with the following conclusions:

(1) The implementation of the improvised warning device was useful and valuable to the students. The improvised warning device was fully functional showing its efficiency and effectiveness in developing students' preparedness and disaster risk management;
(2) Students have learned the use of improvise warning device as all groups had shown exemplary performance in the activity;
(3) The results showed that students were engage in the laboratory activity. Thus, it increases students' performance and preparedness on disaster risk management;
(4) Students developed collaboration, cooperation and skills during the implementation. Furthermore, it made them become aware and prepared of typhoons and its potential risk. Students have learned the different responses to these disasters based on the warning device. Through a group activity, students fulfil teams' role and duties, make decision and share information and;

(5) With the use of the improvise warning device, the students learned to measure rainfall, analyze typhoon behavior and its potential risk and developed their preparedness on disaster risk management.

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A Study on the Difficulties of Instructional Process on English for Proficiency Test Course perceived by Business Students

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Abstract

The purposes of this research were 1) to investigate current problems obtained by the business students through English for Proficiency Test Course in three aspects: Teaching Techniques, Teaching Materials and Assessment; and 2) to study additional suggestions. The samples of this research were the 75 business students who enrolled English for Proficiency Test Course in 2016 academic year. The instruments used were questionnaires consisted of three aspects: Teaching Techniques, Teaching Materials and Assessment. The statistical values were the frequency, percentage, mean and standard deviation. The results from the study will be analyzed to find solutions for improving teaching-learning process in the future.

Keywords: *EFL Classroom, EFL Teaching-Learning Process, Teaching for TOEIC Test*

Introduction

Among those necessary working skills, English language proficiency is one of the most important skills as a fundamental language used in this era of globalization (Kanitpong 2012). Take India, individuals who are a good command of English earn significantly higher relative wages and better occupation outcomes even for the same level of overall education. As stated by The SUNDAY TIMES (2011), the importance of English in the workplace is a top concern among employers in Sri Lanka. 95% of employers believe that better English helps improve the productivity of organization, and 66% of employers turn down applicants due to a bad command of English. In this case, it might be implied that the improvement in English language proficiency is an essential key characteristic to ensure that Thai workforce will be beneficial from the economic liberalization. Nevertheless, it is crucial to understand the roots of English problems in Thai student as well as investigate the learning activities to enhance Thai students' human capital in order to achieve in this competitive era.

A proficiency test is used to measure a learner's level of language. It can be compared with an achievement test, which evaluates a learner's understanding of specific material, a diagnostic test, which identify areas to work on, and a prognostic test, which tries to predict a learner's ability to complete a course or take an exam. Proficiency tests are uncommon within the classroom but very frequent as the end aim (and motivation) of language learning. The examples of a proficiency test accepted in Thailand are IELTS and TOEFL (BRITISH COUNCIL, 2017).

However, many companies in Thailand have highly regarded on the TOEIC scores as well. TOEIC or Test of English for International Communication is remarkable concern in case of employment for a new employee, and promotion for an existing employee. The test is produced by ETS (Educational Testing Service) which evaluates personal ability in English communication. Currently, TOEIC is executed in about 60 countries which approximately 4,500,000 people are taking TOEIC in a year. The TOEIC test questions are based on real-life working setting in an international environment such as meetings, travelling, telephone conversation, etc. The test composes of two separate parts as:

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1. The Listening and Reading test is a paper and pencil test that takes 2.5 hours and is taken at a test centre.

2. The Speaking and Writing test is an online test that is taken in a test center and takes 90 minutes. However, the Speaking and Writing test is a new test which is only available in some countries (CENTER FOR PROFESSIONAL ASSESSMENT (THAILAND), 2014).

College of General Education and Languages, Thai-Nichi Institute of Technology (TNI) has also emphasized on the significance of the TOEIC test. All third year students have to take the TOEIC test before their Cooperative Education as the students' TOEIC scores are used to classify the rank of organizations for their Cooperative Education. Moreover, the TOEIC test is recognized as the global standard for assessing English proficiency for business to help organizations build a more effective workforce. Thus, it is vital for all TNI students to prepare themselves for an internationally competitive edge.

However, according to research done by Anuyahong (2012), it was found out that the TOEIC scores of TNI students are not in a satisfaction level, especially in business students. Therefore, it is significant for College of General Education and Languages to find out the current problems on instructional process of English for Proficiency Test course in order to improve teaching-learning process in this course for the next semester.

Research Purpose

The purposes of this study were:

1) To investigate current problems obtained by the business students through English for Proficiency Test Course in three aspects: Teaching Techniques, Teaching Materials and Assessment; and

2) To study additional suggestions.

Research Methodology

Population and Samples

Population of this study was 120 second-year business students in the second semester of 2016 academic year at Thai-Nichi Institute of Technology.

Samples in this study were 75 second-year students who enrolled English for Proficiency course in the second semester of 2016 academic year.

Instrumentation

The instrument used in this study was a questionnaire based on the difficulties of instructional process on English for Proficiency Test course for the second year business students.

The first part (Part 1) of this questionnaire asked for the demographic information on the students' gender. The second part (Part 2) concerned on the difficulties of instructional process on English for Proficiency Test course. This part comprised of 30 items of in three aspects: 10 items of Teaching Techniques, 10 items of Teaching Materials and 10 items of Assessment. The five levels of problems used in the questionnaire were ranked as "The highest problem,", "High problem", "Moderate problem", "Low problem" and "The lowest problem". Responses from the student questionnaires were subsequently coded. The data of the students' coded responses were statistically calculated and analysed. The computation of Cronbach's Alpha as a measure of reliability was employed to indicate how reliable the research questionnaire results were. Reliability was defined as the proportion of the students'

responses to each item in the questionnaire and the reliability coefficient or calculated alpha was a lower bound of the true reliability of the research instrument, or the questionnaire. The descriptive statistics was also used to determine the individual summary statistics for each of the 30 items in the questionnaire.

The third part (Part 3) asked for more opinions and suggestions on the difficulties of instructional Process on English for Proficiency Test course of the business students based on open-ended questions.

Data collection

A study on the difficulties of instructional process on English for Proficiency Test course of the business students was accessed through the questionnaire in the second semester of 2016 academic year.

The administration of the research questionnaire was conducted in English for Proficiency course (ENL-412). Part 1 concerns the demographic variables about the students' gender. The 30 items of Part 2 covered the difficulties of instructional process on English for Proficiency Test course in three aspects: Teaching Techniques, Teaching Materials and Assessment. The participants were requested to consider each item carefully and indicate how important each item was for their study. A total of 75 business students completed the questionnaire. The students' responses from the questionnaire were subsequently coded using computer program as follows: "1 = male and 2=female" for genders; and "1=the lowest problem, 2 =low problem, 3 = moderate problem, 4 = high problem, 5 = the highest problem" for each of the five levels of importance on 30 items in Part 2.

The analyses of the research data were conducted by means of descriptive statistics. The descriptive statistical analyses of the frequencies and percentages of the students' responses were employed to report their demographic variables and to indicate the rank order of the items in each area of the difficulties of instructional process on English for Proficiency Test course listed in the questionnaire. The frequency distributions were analysed to determine the proportions of the students' responses to the five levels of importance on the 30 items in three areas: 10 items of Teaching Techniques, 10 items of Teaching Materials and 10 items of Assessment.

Data Analysis

Data analysis from questionnaire both single item and whole questionnaire which presented a form of rating scale. These rating scales were calculated to find out mean and standard deviation and then translated based on criteria developed by Best (1981) as follows:

1.00 <= < 1.50 refers to students had the lowest problem.
1.51 <= < 2.50 refers to students had low problem.
2.51 <= < 3.50 refers to students had moderate problem.
3.51 <= < 4.50 refers to students had high problem.
4.51 <= < 5.00 refers to students had the highest problem.

The collected data was analysed using computer program. The statistics used for analysing the data were frequency, percentage, mean, standard deviation, and content analysis.

Results

Phase 1: The results of demographic data

The analysis of the data from the students' questionnaire was presented in the first section deals with the demographic variables from the students' responses to Part 1 of the questionnaire in the following table.

Table 1: Table of the results of demographic data of respondents

Demographic data of respondents	**n=75**	**Percentage**
Gender		
1.1 Male	38	50.67
1.2 Female	37	49.33
Total	**75**	**100**

The table showed that percentages of business students in gender ranged from 50.67% for male students and 49.33% for female students.

Phase 2: the difficulties of instructional process on English for Proficiency Test course

Table 2: Table of Mean ($\bar{x}$) and Standard Deviation (S.D.) of the difficulties of instructional process on English for Proficiency Test course in overall

No.	**Cluster**	$\bar{x}$	**S.D.**	**Level**
1.	Teaching Techniques	1.84	0.71	Low
2.	Teaching Materials	1.69	0.77	Low
3.	Assessment	1.95	0.79	Low
Total		**1.82**	**0.75**	**Low**

The above table presented that the overall mean score of the difficulties of instructional process on English for Proficiency Test course was at a low level ($\bar{x}$=1.82). The lowest rank of the problem was at Teaching Materials ($\bar{x}$=1.69), followed by Teaching Techniques ($\bar{x}$=1.84) and Assessment ($\bar{x}$=1.95).

Table 3: Table of Mean ($\bar{x}$) and Standard Deviation (S.D.) of the difficulties of instructional process on English for Proficiency Test course in Teaching Techniques

No.	**Teaching Techniques**	$\bar{x}$	**S.D.**	**Level**
1.	The teacher does not meet the goals set in the lesson plan.	2.41	0.79	Low
2.	The teacher focuses on teacher- centre approach.	2.47	0.81	Low
3.	The teacher lacks of teaching techniques that motivate students to learn on their own.	1.77	0.61	Low
4.	The teacher did not focus on varieties of teaching approaches, such as task-based learning, problem-based learning or research-based learning.	1.77	0.71	Low
5.	There is no assignment for students to work outside classroom.	1.72	0.81	Low
6.	The teacher lacks of use of activities that motivate	1.88	0.79	Low

	students to think critically.			
7.	The teacher does not allow students to ask questions or give any comments.	2.11	0.88	Low
8.	The teacher uses language that is too difficult to understand and lacks of explanation.	1.78	0.71	Low
9.	The teacher does not allow students to learn by practicing.	1.11	0.88	The lowest
10.	The teacher lacks of collaborative learning technique.	1.38	0.89	The lowest
Total		**1.84**	**0.71**	**Low**

The above table presented that the mean score of the difficulties of instructional process on English for Proficiency Test course on Teaching Techniques was at a low level ($\bar{x}$=1.84). The lowest problem was "The teacher does not allow students to learn by practicing" ($\bar{x}$=1.11), followed by "The teacher lacks of collaborative learning technique" ($\bar{x}$=1.38) and 'There is no assignment for students to work outside classroom' ($\bar{x}$=1.72).

Table 4: Table of Mean ($\bar{x}$) and Standard Deviation (S.D.) of the difficulties of instructional process on English for Proficiency Test course in Teaching Materials

No.	Teaching Materials	$\bar{x}$	S.D.	Level
1.	The teaching materials do not focus on practicing.	1.10	0.91	The lowest
2.	The teaching materials are not up-to-date.	1.01	0.71	The lowest
3.	The teaching materials do not match with the content.	2.11	0.73	Low
4.	The teaching materials are not varieties.	1.72	0.81	Low
5.	There is a lack of teaching materials that allow students to practice outside classroom.	1.45	0.71	The lowest
6.	There is a lack of teaching materials that enable learners to learn independently.	1.78	0.69	Low
7.	There is a lack of teaching materials that encourage students to become active learners.	2.11	0.73	Low
8.	There is a lack of online learning.	2.27	0.85	Low
9.	There is a lack of authentic materials.	1.74	0.81	Low
Total		**1.69**	**0.77**	**Low**

The above table presented that the mean score of the difficulties of instructional process on English for Proficiency Test course on Teaching Materials was at a low level ($\bar{x}$=1.69). The lowest problem was "The teaching materials are not up-to-date" ($\bar{x}$=1.01), followed by "The teaching materials do not focus on practicing" ($\bar{x}$=1.10) and "There is a lack of teaching materials that allow students to practice outside classroom" ($\bar{x}$=1.45).

Table 5: Table of Mean ($\bar{x}$) and Standard Deviation (S.D.) of the difficulties of instructional process on English for Proficiency Test course in Assessment

No.	Personal Skills	$\bar{x}$	S.D.	Level
1.	There is a lack of testing that integrates four communicative skills.	1.83	0.77	Low
2.	There is a lack of subtests during class to motivate students with enthusiasm.	1.73	0.81	Low

3.	There is a lack of practical measurement.	2.45	0.88	Low
4.	There is a lack of measurement of the authentic materials, such as work instructions or manuals.	1.79	0.73	Low
Total		**1.95**	**0.79**	**Low**

The above table presented that the mean score of the difficulties of instructional process on English for Proficiency Test course on Assessment was at a low level ($\bar{x}$=1.95). The lowest problem was "There is a lack of subtests during class to motivate students with enthusiasm" ($\bar{x}$= 1 .7 3), followed by "There is a lack of measurement of the authentic materials, such as work instructions or manuals" ($\bar{x}$=1.79) and "There is a lack of testing that integrates four communicative skills" ($\bar{x}$=1.83).

Phase 3: Suggestion from the respondents

The suggestions from the respondents were listed as follows:

1. The teacher who teaches this course should have an experience of proficiency test.
2. TNI should invite a guest speaker from the outside organizations to inform the importance of TOEIC test.
3. Teaching materials of TOEIC test should be updated every year.

Conclusion

1. The overall mean score of the difficulties of instructional process on English for Proficiency Test course was at a low level ($\bar{x}$=1.82). The lowest rank of the problem was at Teaching Materials ($\bar{x}$=1.69), followed by Teaching Techniques ($\bar{x}$=1.84) and Assessment ($\bar{x}$=1.95).

2. The mean score of the difficulties of instructional process on English for Proficiency Test course on Teaching Techniques was at a low level ($\bar{x}$=1.84). The lowest problem was "The teacher does not allow students to learn by practicing" ($\bar{x}$=1.11), followed by "The teacher lacks of collaborative learning technique" ($\bar{x}$=1.38) and 'There is no assignment for students to work outside classroom' ($\bar{x}$=1.72).

3. The mean score of the difficulties of instructional process on English for Proficiency Test course on Teaching Materials was at a low level ($\bar{x}$=1.69). The lowest problem was "The teaching materials are not up-to-date" ($\bar{x}$=1.01), followed by "The teaching materials do not focus on practicing" ($\bar{x}$=1.10) and "There is a lack of teaching materials that allow students to practice outside classroom" ($\bar{x}$=1.45).

4. The mean score of the difficulties of instructional process on English for Proficiency Test course on Assessment was at a low level ($\bar{x}$=1.95). The lowest problem was "There is a lack of subtests during class to motivate students with enthusiasm" ($\bar{x}$=1.73), followed by "There is a lack of measurement of the authentic materials, such as work instructions or manuals" ($\bar{x}$=1.79) and "There is a lack of testing that integrates four communicative skills" ($\bar{x}$=1.83).

5. The suggestions from the respondents were listed as follows: 1) The teacher who teaches this course should have an experience of proficiency test; 2) TNI should invite a guest speaker from the outside organizations to inform the importance of TOEIC test; and 3) Teaching materials of TOEIC test should be updated every year.

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Development of An Activity in Hisab Utilizing PhET Simulation

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Abstract

This study presents the development of Hisab activities for madrasa curriculum. The processes involved i.) Analysis of the learners ii.) Identify activity objectives iii.) Developed assessment tools iv.)Development of Hisab activities and v.) Evaluation. Implementation was done in one of madrasa school in Mindanao. The result showed that there was a significant improvement in the performance of the respondents in the pre-test and post-test achievement test. Moreover, the students claimed that the developed activity helped them to have a better understanding of fraction since it gives visual representation. Classroom observation was done by moder and Hisab ustadz. They observed that a.)Students actively participate in class activities by sharing ideas and contributing to the task of the group; b.)students enjoyed in the use of the PhET simulation in Hisab.;c.)students are attentive to the teacher;d.)students are expressing their ideas to the class with the help of the resources in the PhET simulation; e.)students are comfortable using the PhET simulation in Hisab; f.)students are comfortable using the resources in the PhET simulation in Hisab; g.)students are interacting with each other through group works where they discuss and share ideas and solutions. This implies further that the developed activity is not just successful in terms of student learning and outcomes, but it also exceeds the expected or preferred experiences of the students. In addition, the students' actual responses towards the learning log are as followed 1.)they learned about fractions,2.) learned how to make and arrange fraction, 3.)learned how to use technology ,4.)able to understand fraction, and 5.) used PhET simulation in understanding fraction, The researcher recommends the use of Arabic Phet Simulation in teaching math concepts in Madrasa curriculum.

Keywords: *Teaching Fractions, Teaching Math in Madrasah, Math Simulation*

Introduction

With the advent of digital technology, education becomes easier to the learners because of their access on computers. At present, students grow up with the use of computer. In fact, their technical know-how on computer is more advanced than their parents, and teachers be it in high school or in college. While the average adults are mostly familiar only with the basics of computer like word processing, e-mail, facebook, instagram, twitter, and the internet on one hand, the average students are at a dizzying technological level on the other hand. They are not only using personal computer as a writing or communication tool like adults do but they also configure laptops, cellular phones, and other electronic devices with ever expanding range of applications to form complete information and entertainment centers (Madhany, 2005). This is the reason why the school administrators, faculty, curriculum designers and/or planners, and experts have to fully incorporate and utilize the use and usage of computers to make teaching-learning more interesting. Students create an avenue to use computer as an effective and efficient learning tool in all fields of study such as language, religion, geography, science, history, arts, and even mathematics.

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Mathematics is a subject in Madrasah curriculum. Usually, typical Islamic school offers two courses of study: a hafiz course teaching memorization of the Qur'an an alim course leading the candidate to become an accepted scholar in the community. In a regular curriculum, it includes courses in Arabic, tafsir (Qur'anic interpretation), sharī'ah (Islamic law), hadiths (recorded sayings and deeds of Prophet Muhammad), mantiq (logic). Although Hisab (Mathematics) is part of the curriculum, it is not given much attention. With the implementation of K-12 Curriculum in the Philippines, the refined madrasa curriculum is published. Within in this curriculum, Mathematics (Hisab) is one of the contents.

Thus, this study aimed to utilize the simulation software like PhET simulation in some of the Hisab activities in fraction.

Objectives of the Study

The purpose of the study is to look at the Rabie Edhadi Morit's understanding in fraction by integrating the use of PhET simulation. Specifically, it aims to determine the following.

1. The development of the Hisab activities.
2. Comments and suggestion of the ustadz on the hisab activities.
3. The significant difference between the achievement pre-test and post-test of the respondents
4. Classroom observation of the moder and the ustads during the implementation of the activity.
5. The perception of the students towards the implementation of activity in Hisab.

Conceptual Framework

The researcher integrated the use of PhET simulation in teaching fraction since the researcher believed that the students learn best when they have hands-on experience on the lessons. This is supported by Jerome Bruner's Three Tiered Model, wherein learners are observed to retain information when lesson are presented with concrete or enactive (hands-on experience), pictorial or iconic (with the use of pictures), and symbolic. According to Bruner's learning, children remember things better if they discover these by themselves (Corpuz, 2015).

The learners' prior knowledge on fraction was analyzed in the study. Before the implementation of the developed activity, pre-test was given to the *morit* to determine their levels of performance in *Hisab*. This developed activity was validated by the experts, and then certain corrections were incorporated. After the revision, the activity items were implemented. Lastly, a post-test was given to the *morit* to determine if there was a significant difference on the individual understanding of the *morit* and their perceptions.

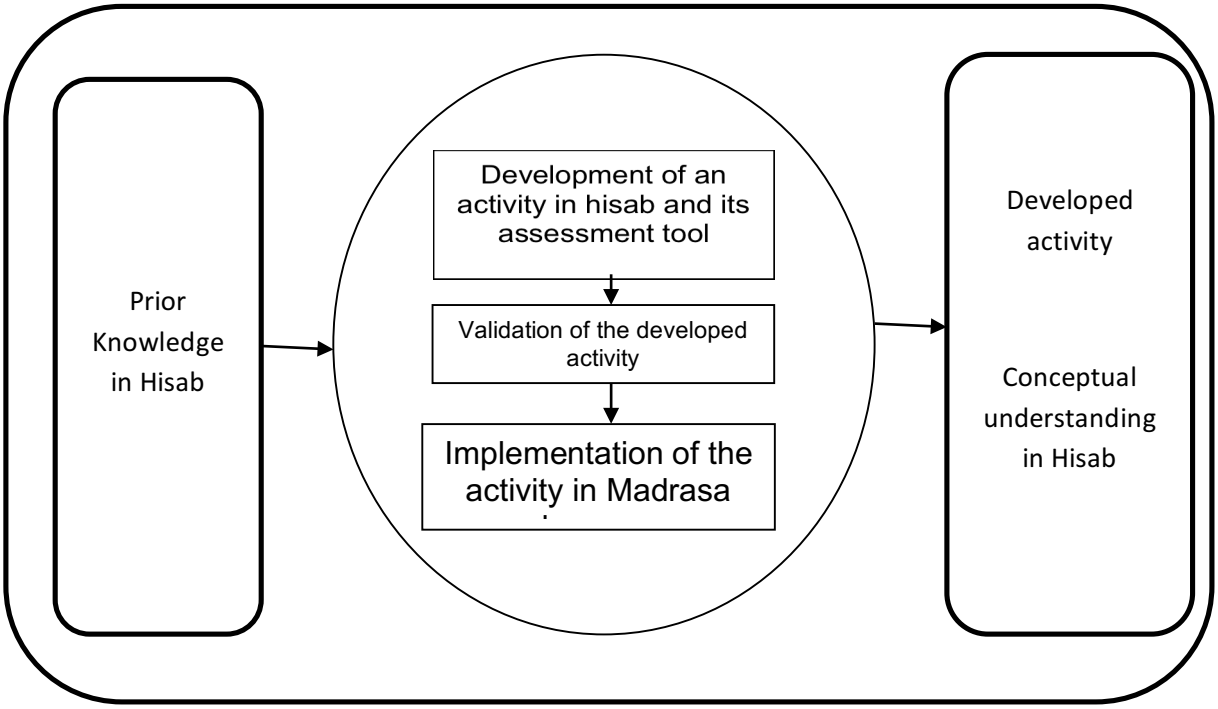

Figure 1. Conceptual Framework of the Study

Significance of the Study

Simulation activities were intended to promote individual learning of the students and support those who lack the conceptual understanding on fraction. The activities helped madrasa students improved their capability to learn individually with lesser possible interventions of the *ustadz*. *Morit* might assume responsibilities for learning and the value and meaning of what they needed to learn.

The outcome of this study would make the *ustadz* engaged in the use of technology in their classes and encouraged them to search for and utilize PhET simulation activities available in the internet that would make the *madrasa* to consider technology.

The information gathered from this study could be put to good use by the *Madrasa* administrators in designing and implementing viable educational management programs such as integrating PhET simulation activities in the classroom discussions which are beneficial to the enhancement of the *morits'* interest.

Furthermore, parents would be aware of on how these PhET simulation activities enhanced the intellectual growth of their children, hence enabling them to actively participate in supporting their children's learning with the aid of computer and internet in *madrasa*.

The result of the study would also encourage software developer to produce more useful education software or applications that were already translated in Arabic form.

Review of Related Literature and Studies

The Department of Education Order No. 51, s.2014 prescribed the adaptation of the standard Madrasa curriculum framework that after five (5) years of implementation, the curriculum will be reviewed to take into account the learner needs, experiences gathered from program implementers, and the current curriculum policies and thrusts of the department such as Multi-lingual education. This contains the vision of the *Madrsa* Learner, the subject description and goal, the learning expectations and competencies, subject areas and the time allotment for the public schools and private *Madaris* (Munib, 2004).

Massialas and Jarrar Education discussed in their first book the issue on political Islam and its impact to school policies which largely embedded in a larger discussion of tradition versus modernity. Less than a decade later, in their second book, they referred to the "pronounced role" (p. 174) of political Islam in determining educational policy and planning. In assessing the impact of Islamic radical movements on the development role of Arab public school systems, they claimed that these movements have "further curtailed the schools from playing a major role in changing the society by demanding more time and effort to be spent on religious and humanistic studies rather than on applied sciences and technology."

In the study of Sarip (2003) on Arabic teaching program in Lanaodel Sur, several problems were identified like the lack of textbook, references, classrooms and instructional items of the Arabic teachers. Also, Mindalano
(2004) claimed that teachers in Arabic are not that competent enough due to the lack of needs in teachings. In support with this claim, Mangantal (2009) said that the poor performance of students is the lack of textbooks and references in Hisab.
According to Lapus (2014), Hisab in Madrasa provides learners with opportunities in the acquisition of skills and competencies necessary to gain understanding and appreciation of the subjects from lower to higher grades. Hisab teaching encourages the learners through hands-on, minds-on, manipulative and interactive activities. Pupils learn on their own, e , discover, generalize and apply what they learned in their daily lives. These activities a e effective by using appropriate teaching strategies, approaches, techniques and adequate instructional materials.

Technology in Teaching Mathematics

Studies have shown that children conversant with technology show improvements in their writing, reading and math skills. Technology has also contributed to decrease the rates of dropouts, improvement of student's attendance and enhancement of learning abilities. Technology in school benefits the children during their higher education. It lays a strong foundation of a successful professional life of an individual (Oak, 2011).

The most important aspect of computers in education is that they provide drill and practice for the students. Unlike teacher instruction, which may become tedious over time, computers provide motivation to the student to continue learning (Leu, 2000). Even from preschool, CAI and the experience of a prepared educator led to significant gains in academic pursuit and knowledge (Plowman and Stephen, 2005). Utilizing computers in education makes abstract concepts visible to students who may be discouraged from learning material. In a study by Hurme (2005) on the effectiveness of computers used in problem solving mathematics, the use of computers is an ideal method of teaching. Computers help students to "use their mathematical knowledge and stimulate them into making their thinking visible."

As mentioned by Russell and Sorge (1999), they claimed that the proper implementation of technology in the classroom gives students more control of their own learning and it enables the teacher to do different instruction considering the divergence of students' readiness, levels, interests, multiple intelligence, and learning styles. Technology also helps students become life-long learners (Abdulwahad and Cadalay. 2010).

It was found out by Edul and Tampus (2006) as cited by Abrera and Perez that multimedia approach in teaching has positive effects on students' understanding in linear equations and inequalities in one variable. Also, integrating technology in teaching yields positive effects in students' performance and behaviors.
In the study of Candau and others (2005) as cited by Abdul and Borongan (2007), it was a program that commenced worldwide that help teachers in assimilating technology into classroom activities to develop student learning effectively.

In a balanced mathematics program, the strategic use of technology enhances mathematics teaching and learning. Teachers must be knowledgeable decision makers in determining when and how their students can use technology most effectively. All schools and mathematics programs should provide students and teachers with access to instructional technology, including appropriate calculators, computers with mathematical software, Internet connectivity, handheld data-collection devices, and sensing probes. Curricula and courses of study should incorporate instructional technology in learning outcomes, lesson plans, and assessments of students' progress. Programs in teacher education and professional development must continually update practitioners' knowledge of technology and its classroom applications. Such programs should include the development of mathematics lessons that take advantage of technology-rich environments and the integration of technology in day-to-day instruction, instilling an appreciation for the power of technological tools and their potential impact on students' learning and use of mathematics. All teachers must remain open to learning new technologies, implementing them effectively in a coherent and balanced instructional program. These tools, including those used specifically for teaching and learning mathematics, not only complement mathematics teaching and learning but also prepare all students for their future lives, which technology will influence every day.

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Subject of the Study

The respondents of the study composed of 14 *Rabie Edhadi morits* (3 were males and 11 were females) in one of the madrasah school in Lanao del Sur, Mindanao for the academic year 2016-201.

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Research Design

The research design of the study is one group pretest-posttest design with qualitative support. a pre-test and post-test were given to investigate the conceptual understanding of the respondents in fraction after integration of PhET simulation in Hisab activity.

Data Gathering Procedure

The first step is the mapping of the objective against the madrasa curriculum guide. After mapping, the researcher developed the instrument needed for the study which was the Phet simulation that was chosen for the activity. The instruments and the activity were validated through face validation of the adviser and some experts ustadz were also asked for the validation. After revising, the researcher used the instrument and the activity then implemented them in a madrasa classroom. The conceptual understanding and perception of the respondents regarding the integration of PHET simulation was obtained after the implementation.

The researcher administered an achievement Pre-test on the first day of the implementation in order to measure the respondent's prior knowledge and skills before conducting the activity.

The lessons were given on the second day. The researcher conducted an orientation to the respondents regarding to the activities and the use of Phet simulation on the third day and do the activities . Afterward the researcher administered the post-test and the perception questionnaire was administered to the respondents.

Results and Discussions

Development of the activity in Hisab

Backward curriculum design was utilized in developing the Hisab activity where the process involveda.) Analysis of the learners b.)Identify activity objectives c.) Developed assessment tools d.)Development of Hisab activities and e.) Evaluation.

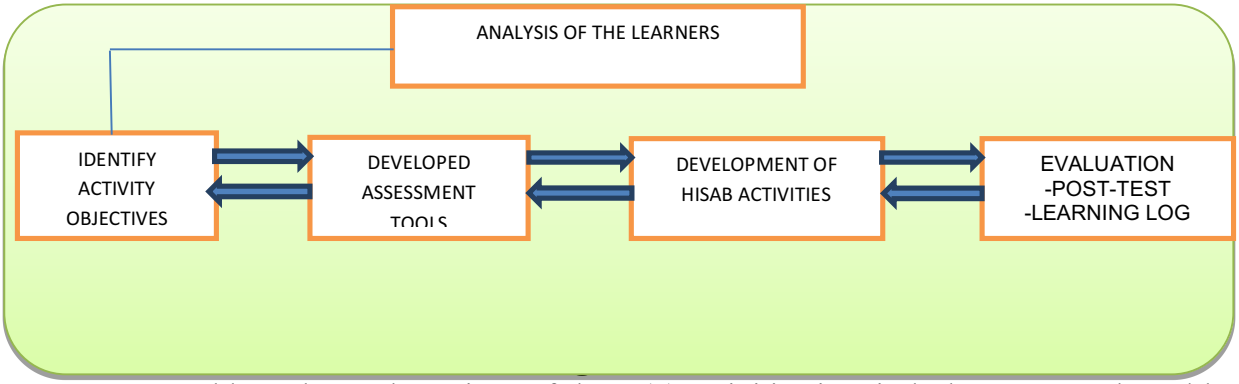

Table 1 shows the ratings of three (3) activities in Hisab that were evaluated by the Moder and ustadz in madrssa.

Table 1. Rating of the activities in hisab

Category	Rating							
	Activity 1	Description	Activity 2	Description	Activity 3	Description	Overall rating	
Description of the activity	3	VG	3	VG	3	VG	3	VG
Direction of the activity	3	VG	3	VG	3	VG	3	VG
Let's Practice of the activity	3	VG	3	VG	3	VG	3	VG
Mean	3	VG	3	VG	3	VG	3	VG

Among the three (3) activities in Hisab, all got a perfect mean score of 3, giving these with very good (VG) rating. This indicates that the three activities were ready for implementation in madrasa classroom setting.

Performance of the respondents in the Achievement Test

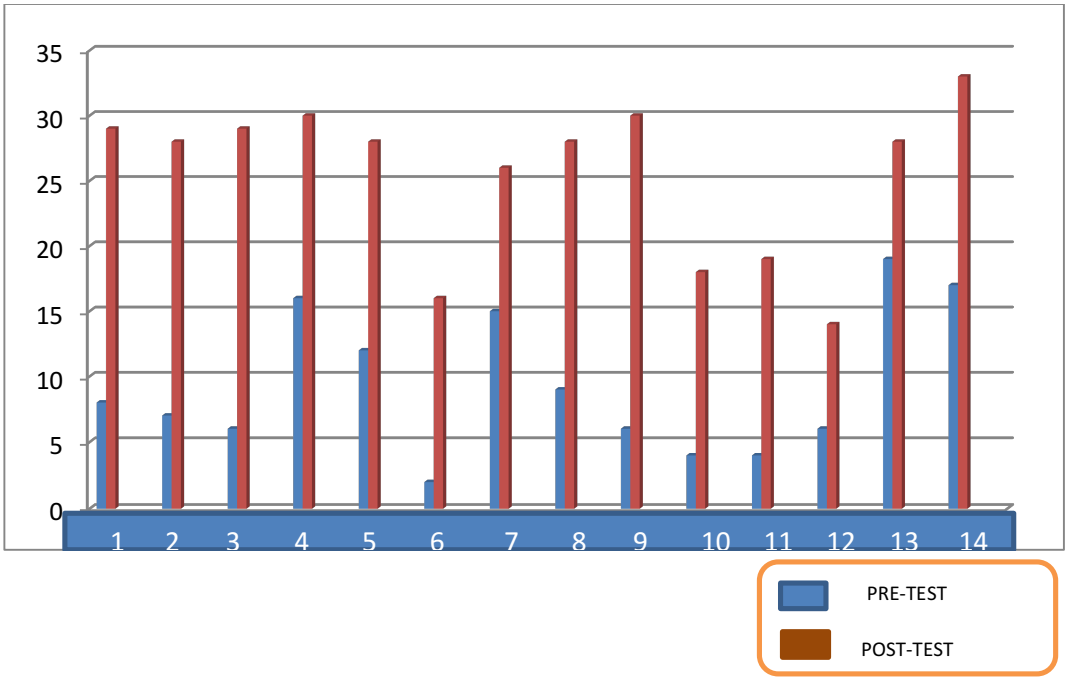

Figure 1. Pre-test and Post-test Achievement Test of the respondent

As shown in Figure 13, the blue bar indicates the Pre-test of the respondents and the red bar indicates the post-test performance of the respondents had an increase in the performance.

Figure 13 presented the performance of each respondents in pre-test and post-test on the average, the mean of pre-test and post-test scores are 9.36 and 25.43 respectively. The result suggested that the post-test score is higher than pre-test score.

Table 2. Comparison between the Pre-test and Post-test of the respondents

Achievement test	mean	Standard deviation	Mean difference	t-value	P value	Remarks
Pre-test	9.36	5.46	16.07	1.77	0.000002	Significant
Post-test	25.43	5.99				

Table 2 shows the respondents pre-test had a mean score of 9.36 and post-test mean of 25.43, respectively.This shows there was a mean difference of 16.07. As observed, the t value of 1.77 with a p-value of 0.000002 which is lesser than 0.05 level of significance. This indicates that there was a significant difference between the pre-test and post-test achievement test of the respondents. The result implies that there was an improvement of performance after implementation of the hisab activity.

Classroom observation during the implementation

Students' Behavior

There are nine attribute statements are given to the observers to read and check which of the four choices satisfy them based on their observation. There are four statements that are *observed to more than 75% of the class* and those are the following; (1)Students actively

participate in class activities by sharing ideas and contributing to the task of the group because of the use of the PhET simulation, (3)Students enjoyed in the use of the PhET simulation in Hisab, (4)Students are attentive to the teacher, (6) Students are expressing their ideas to the class with the help of the resources in the PhET simulation.

Meanwhile only two statements *Observed to half but less than 75% of the class and those are*(8) Students are comfortable using the PhET simulation in Hisab. (9) Students are comfortable using the resources in the PhET simulation in Hisab. and there are also two statements that are *Observed to a less than half of the class; (5)*Students are interacting with each other through group works where they discuss and share ideas and solutions (7) Students are quiet in the class.

Lastly, there was only one statement that are *Not Observed at all; (2)* Students are doing off task interactions with classmates (chatting not related to class discussion, texting, other tasks that may disrupt others)

In addition to this, the observers were asked to write down their other observations in the given spaces in the observation checklist especially about what the students were doing with the laptops, the resources in the PhET simulation, and even with the PhET simulation itself.

Teacher's Behavior

In teacher's behavior there are thirteen attribute statements are given to the observers to read and check which of the four choices satisfy them based on their observation. One statements that are *observed to more than 75% of the class* and those are the following; (8) The teacher employs cooperative learning in the activities using the PHET simulation. while there was only one statements also *Observed to half but less than 75% of the class that was* (11)The teacher uses the resources in the PhET simulation as a supplemental resource to the lesson.

Meanwhile, five statements that are Observed *to a less than half of the class; (6)*The teacher attends to the needs of the students related to the use of the PhET simulation, (9)The teacher gives activities that allow students to explore concepts (exploratory developmental activities) using the resources in the PhET simulation (10)The teacher presents the lesson using entirely the resources in the PhET simulation. (12) The teacher uses the PHET for assessment.

Lastly there was only one statement that are *Not Observed at all;(7)* The teacher has alternative activities in cases when there are technical problems related to the PHET simulation

. In addition to this, the observer were asked to write down their other observation in the provided spaces in the observation checklist (particularly on how it the use of the PHET simulation enhanced the presentation of the lesson or even the activities of the students.

Respondents Perceptions on the Activities

In the first question in the learning log which "What have I learned today?" was categorized according to the content and these were the following: (1) I learned about Fraction, (2) I learn how to make and arrange fraction, (3) I learn how to use technology and lastly, some respondents simply said that (4) Yes, I learned today.

In the second question in the learning log which "Which of this learning is most important to me? was categorized according to the content like the following: (1) Being able to understand fraction; (2) How to make fraction using laptop; (3) Use PhET simulation and understanding fraction; and lastly, some respondents simply said that (4) At least I learned.

In the third question in the learning log which "Which of this learning is most important to me? Was categorized in two according to the content: (1) appreciate using laptop in understanding fraction; and (2) the use of technology in understanding fraction

The 14 respondents encircled the happy face in the last question. This implies that the respondents were happy in doing the activity.

Summary of Findings

The following are the findings of this study:

1.Development of Hisab Activities

Backward curriculum design was utilized in developing the Hisab activity where the process involveda.) Analysis of the learners b.)Identify activity objectives c.) Developed assessment tools d.)Development of Hisab activities and e.) Evaluation.

1.1 Analysis of learners was done first before the development of the activities .Alongside with this, the result of the pre-test.

1.2 the activities is in line with the major goal and objective in Hisab which is to demonstrate understanding and skills in computing with considerable speed and accuracy, estimating, communicating, analytical and critical thinking in solving problems in daily life using appropriate technology.

1.3 Utilizing the result with appropriate assessment tools were embedded in the design of the activities in Hisab. The assessment tool(i.e Achievement test, learning log, checklist) in attainment of the learning outcomes.

1.4 Jointly with the two lesson plan and the three activities were made from its English version to its Arabic version that was translated by the English Arabic translator.

1.5 The 35-item , researcher-made achievement test was given at the beginning and end of the implementation of the study as pre-test and post-test. The mean differences of the scores of the students in achievement test during the pre-test and post-test has p values which are less than $\propto = 0.05$.

1.6 The respondents pre-test had a mean score of 9.36 and a post-test mean score 25.43,respectively. This shows there was an increase of 16.07.Upon application of paired t-test, its is found to be significant (p-value $< \propto = 0.05$) which means that there isa significant difference in the pre-test and post-test achievement performance of students. This implies that student's performance have improved using the developed activities.

2.The teachers-students observation was summarized. In students' behavior, there are nine attribute statements are given to the observers to read and check which of the four choices satisfy them based on their observation. There are four statements that are observed to more than 75% of the class and those are the following; (1)Students actively participate in class activities by sharing ideas and contributing to the task of the group because of the use of the PhET simulation, (3)Students enjoyed in the use of the PhET simulation in Hisab, (4)Students are attentive to the teacher, (6) Students are expressing their ideas to the class with the help of the resources in the PhET simulation.

Meanwhile only two statements Observed to half but less than 75% of the class and those are(8) Students are comfortable using the PhET simulation in Hisab. (9) Students are comfortable using the resources in the PhET simulation in Hisab. and there are also two statements that are Observed to a less than half of the class; (5)Students are interacting with each other through group works where they discuss and share ideas and solutions (7) Students are quiet in the class.

Lastly, there was only one statement that are Not Observed at all; (2) Students are doing off task interactions with classmates (chatting not related to class discussion, texting, other tasks that may disrupt others) In addition to this, the observer were asked to write down their other observation in the given space in the observation checklist especially about what the students are doing with the laptops, the resources in the PhET simulation, and even with the PhET simulation itself and the following are the answer ; according to the first observer he

stated that "I, observe, it was good, the students are happy while they are doing the activity", the second observer stated that "if I am going to compare it with the other group, the one who use PhET had a good interaction to the learners. every time they saw the smiley face they also smile", the third observer stated that" All learners are cooperating with the teacher", and lastly, the fourth observer stated that "All students are answering in laptop and cooperating to the teacher".

In teacher's behavior there are thirteen attribute statements are given to the observers to read and check which of the four choices satisfy them based on their observation. One statements that are observed to more than 75% of the class and those are the following; (8) The teacher employs cooperative learning in the activities using the PHET simulation. while there was only one statements also Observed to half but less than 75% of the class that was (11)The teacher uses the resources in the PhET simulation as a supplemental resource to the lesson.

Meanwhile, five statements that are Observed to a less than half of the class; (6)The teacher attends to the needs of the students related to the use of the PHET simulation, (9)The teacher gives activities that allow students to explore concepts (exploratory developmental activities) using the resources in the PhET simulation (10)The teacher presents the lesson using entirely the resources in the PhET simulation. (12) The teacher uses the PhET for assessment.

Lastly there was only one statement that are Not Observed at all;(7) The teacher has alternative activities in cases when there are technical problems related to the PHET simulation .In addition to this, the observer were asked to write down their other observation in the given space in the observation checklist particularly on how it the use of the PhET simulation enhanced the presentation of the lesson or even the activities of the students. and the following are the answer; According to the first observer he stated that "Students listen and answer well", the second observer stated that "I feel the question of the students to the teacher, everyone is active in the classroom", the third observer stated that" Students are so happy and the teacher is really facilitating them like roaming around while everyone is busy", and lastly, the fourth observer stated that "It helps to the lesson"

3. In the respondents perception that was obtained through earning log with four open-ended question; In the first question in the learning log which "What have I learned today?" was categorized according to the content and these were the following: (1) I learned about Fraction, (2) I learn how to make and arrange fraction, (3) I learn how to use technology and lastly, some respondents simply said that (4) Yes, I learned today. In the second question in the learning log which "Which of this learning is most important to me? was categorized according to the content like the following: (1) Being able to understand fraction; (2) How to make fraction using laptop; (3) Use PhET simulation and understanding fraction; and lastly, some respondents simply said that (4) At least I learned. In the third question in the learning log which "Which of this learning is most important to me? Was categorized in two according to the content: (1) appreciate using laptop in understanding fraction; and (2) the use of technology in understanding fraction for the fourth question the 14 respondents encircled the happy face. This implies that the respondents were happy in doing the activity.

Conclusions

With the findings undertaken in the study, the researcher concluded the following:

1. In developing a Hisab activity, the process involved a.)Analysis of the learners b.)Identify activity objectives c.) Developed assessment tools d.) Development of Hisab activities and e.) Evaluation.

2. Comments and suggestion for the activities were collected through interview. Based from the answers, researcher gone through a lot of things in convincing the madrasa moder to pusrue the study. and at the end of the activities they appreciate how the developed activity help the students in understanding fraction.

3. In the achievement test scores, post-test scores was higher than pre-test score. The result also indicated that there was a significant difference between the pre-test and post-test achievement test of the respondents. The result implies that there was an improvement of performance after implementation of the Hisab activity.
4. The behavior of students during the activities is fairly relative or proportional enough to the teacher's activities.1.)Students actively participate in class activities by sharing ideas and contributing to the task of the group because of the use of the PHET simulation, 2.)students enjoyed in the use of the PHET simulation in Hisab, 3.)Students are attentive to the teacher, 4.)Students are expressing their ideas to the class with the help of the resources in the PHET simulation,5.)students are comfortable using the PHET simulation in Hisab, 6.)students are comfortable using the resources in the PHET simulation in Hisab,7.)students are interacting with each other through group works where they discuss and share ideas and solutions. This implies further that the developed activity is not just successful in terms of student learning and outcomes, but it also exceeds the expected or preferred experiences of the students.
5.The students' actual responses towards the learning log are as followed 1.)they learned about fractions,2.) learned how to make and arrange fraction, 3.)learned how to use technology ,4.)able to understand fraction,5.) generated fractions using laptop,6.) used PhET simulation in understanding fraction, 7.) appreciated the using of laptops in accessing the PhET simulation application,8.)happy with the use of internet and Wifi connectivity in understanding fraction.

Recommendations

On the basis of the results of the study, the following were recommended:
1. Ustadz should develop teaching strategies to help the morit to improve academic grades and performance in Hisab. As a facilitator of learning, ustadz should engage and familiarize them to the newer multi-media technology to better assist the teaching-learning process.
2. The integration of PhET simulation in madrasa classroom should be encouraged in order to significant improve the morit's performance in Hisab.
3. Future researcher should develop new PhET simulations that are readily available to the morit and are already translated in Arabic language; develop an offline PhET simulation; and study the effectiveness of PhET simulation in hisab activity.

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Poster Presentation

The Study of Process and Writing Skill implementing Lesson Study and Open Approach in English Language Subject for Grade 8 students of Khon Kaen Demonstration School (Modindang)

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Abstract

The purpose of this research were to study the process and learning management outcomes implementing lesson study and open approach in English language subject for grade 8 students of Khon Kaen Demonstration School (Modindang), and to improve students' writing skill achievement using lesson study and open approach in English language subject for grade 8 students of Khon Kaen Demonstration School (Modindang). The passing criterion was 65. The target group was a total of 35 students who were studying in semester 1 of academic year 2016 of Khon Kaen Demonstration School (Modindang). Research instruments were 7 lesson plans covered 32 periods, and they were used as the learning management tool. Reflection records and classroom management evaluation forms were used as the data collecting tool in order to study learning management process. And writing evaluation form was used as the tool for investigating students' writing skill knowledge. The research was conducted by implementing lesson study including open approach as an instructional method. Data was analyzed through summary and interpretation of students' learning behavior. Speaking skill knowledge was analyzed by mean ($\bar{x}$), and the percentage of writing evaluation form.

Moreover, the process of lesson study consisted of Planning stage. The researchers and the teacher planned the learning management altogether by using Observation stage, and Reflection stage. For open approach, it comprised of 4 steps as follows: Presenting open-ended problems, students learn by themselves, Discussion and extension of the concept and, the teacher sums up the students' concepts. The research findings revealed that students were able to apply their body of knowledge to compose and present the stories which they were interested in. The students gained the average score of 44.40 percent in other words 67.69 percent which was higher than the requirement. Also, the number of students who passed the criterion was 23 students or 65.71 percent which was also higher than the requirement.

Keywords: Lesson Study, Open Approach, Writing Skill

Introduction

Education is an important tool in creating and nurturing human resources to develop a progressive and sustainable society. Learning process management is important. National of Education Act B.E. 2542, and amendments: second National Education Act B.E. 2545 Chapter 4 Education Management Guidelines Section 24 Learning Management focuses on

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content and activities that are in accordance with the interest and aptitude of learners, promote skill training, thinking process, management, situation control and applying knowledge to prevent and solve problems (Ministry of Education, 2003)

Presently, English is an important language in communicating with people from all around the world for understanding in the same direction and create good relations around the world. It can be said that for teaching 'English for communication', all communication learners must receive training for listening, speaking, reading and writing skills. English writing skill is an important skill since writing will help communicating with others, take records of things that were learnt or know and able to transfer their knowledge to others. Written language users must have the ability to use language correctly according to regulations since if used incorrectly; the meaning will be incorrect or have no meaning at all. Panu Harnjing, Pattanachai Tanadkha and Panomwan Suriyamonton. (2010).

In addition, writing is a way to transfer feelings and needs of an individual as a symbol. The KKDemon School (M), Department of Foreign Languages had set a guideline to develop learners to have said skills. The teaching team had together planned lesson plans, implemented the plans, observed the learning activities in all lesson plans and in the last step, the teaching team reflected the results of the lessons together on the observations of lesson to develop the lesson plans and use to amend lesson plans for future classes. It is in accordance with lesson study, an innovation set up in the expectations of teacher training curriculum. This effort had expanded towards the development of teacher profession on the foundation of lesson study in starting to bring lesson study in to Thai school. There are three processes of lesson study comprised of the planning stage, observation stage and discussion after lesson or Reflection stage. (Inprasitha, 2010).

Additionally, learners should be supported to meaningfully learn language skills so that learners can remember the content, think together and apply them suitably according to the situation. From studying the concept and theory, it was found that Open Approach that encourages learners to together present the method to solve problems, learn the content and knowledge by themselves through discussion with the whole class. Lastly, the teachers and learners summarized the content by connecting ideas from the class, activities both in groups and individually.

Research Objectives

1 . To study the process and learning management outcomes implementing lesson study and open approach in English language subject for grade 8 students of Khon Kaen Demonstration School (Modindang)

2. To improve students' writing skill achievement using lesson study and open approach in English language subject for grade 8 students of Khon Kaen Demonstration School (Modindang)

Definitions

1. Lesson Study

The researchers proceeded according to the 3 stages: Planning stage between the researchers and participating teachers.

Stage 2 Observation stage. In this stage, the lesson plans will be implemented by the teacher. The objective of the observation will focus on the students' thinking, not in the teacher's teaching ability.

Stage 3 Reflection stage on what was found from observing the lesson to develop the lesson plans and amend lesson plans for further implementation.

Research Procedure

1. Scope of the Research

The target group was a total of 35 students who were studying in semester 1 of academic year 2016 of Khon Kaen Demonstration School (Modindang). Independent Variable is learning process using lesson study and open approach

Dependent Variable

1. The process and learning management outcomes implementing lesson study and open approach English language subject for grade 8 students of Khon Kaen Demonstration School (Modindang)

2. Students' writing skill achievement using lesson study and open approach in English language subject for grade 8 students of Khon Kaen Demonstration School (Modindang). The passing criterion was 65.

2. Research Instruments

2 . 1 Research instruments were 7 lesson plans which covered 32 periods. The researchers have studied theories, concepts, principles and related research to learning management on lesson study and open approach. In this research, the learning management has been centered on the Basic Education Core Curriculum B.E. 2551 (A.D. 2008). The researchers have analyzed content from the English Department curriculum secondary section of Khon Kaen Demonstration School (Modindang) by analyzing content from the vision map to create a teaching schedule that divides appropriate time between content and activities that is in accordance with learning objectives of grade 8 curriculum and guidelines. The lesson plans were examined by experts for suggestions on content relevant, learning management and evaluation. Three experts examined face validity of the Likert-type opinionnaire which is a rating scale with five levels (Samphan Phanpruk, 2007). The results of the evaluation were that the lesson plans are very suitable.

2.2 Instruments used in data collection to study the learning management process were reflection records and classroom management evaluation forms, borrowed from the Research in Mathematics Education (CRME), Khon Kaen University.

2.3 Instrument used to study writing skill knowledge of students was the writing evaluation form which the researchers created according to the behaviors which will be studied consisting of 1) Writing Ability 2) Vocabulary 3) Grammatical structure 4) Continuity 5) Effort to communicate. Three experts examined face validity of the Likert-type opinionnaire which is a rating scale with five levels (Samphan Phanpruk, 2007). The results of the evaluation were that the lesson plans are very suitable.

3. Research Design

The research was conducted by implementing lesson study from the Mathematics Education (CRME) and open approach as an instructional method in the lesson study process consisting of 4 steps as follows:

1. Posing open-ended problem
2. Students' self-learning
3. Whole class discussion and comparison
4. Summarization through connecting students' mathematical ideas emerged in the classroom

4. Research Methodology

4.1 Data Collection

The researchers used the Lesson Study Approach and the Open Approach as the learning management.

4.2 Data Analysis

4.2.1 For the learning management process implementing lesson study and open approach, the students' learning behavior was summarized and interpreted from reflection records and classroom management evaluation forms.

4.2.2 Writing skill achievement. Scores from the writing evaluation form were analyzed by mean ($\bar{x}$) and the percentage.

5. Research Results Conclusion and Discussion

1. Results of the process and learning management outcomes implementing lesson study and open approach in English language subject for grade 8 students of Khon Kaen Demonstration School (Modindang)

1.1 Planning stage

Learning Unit 1 Household chores

Step 1: Presenting open-ended problems. Researchers and assistant researchers had planned a situation that corresponds to the content for students to think together and present through writing skill. Learners in the group had to help their classmates think what the meaning of chores is. Students read a conversation related to children's responsibilities toward doing chores. Members in each group together selected a suitable adverb of frequency to the content. Researchers played a game that consists of showing signs. Students had to guess the learning topic from the sentences that will be shown one at a time. When the students have guessed correctly, the students had to think of activities they like to do on Sunday, and write the vocabulary on the back correctly.

Step 2: Students exchange and learn vocabulary and place them onto the blackboard. In this step, there is a preparation for students to walk around and look at vocabulary that were different from their own group.

Step 3: Discussion of concept. Students in each group chose two sentences on household chores to present in front of the class. Each group then explain the reason they selected to use the words *always, usually, often, sometimes* and *never*.

Step 4: Summary of concepts. From the concepts of students, the teacher supplemented vocabularies *take out the rubbish, feed the dog and vacuum the floor.* and corrected the usage of words. Students used *cut the lawn*, which was changed to *mown the lawn cut the grass.*

Learning Unit 2 TV and films

Step 1: Creation of situation. Students in each group chose one movie per group and together decide what type of movie is it. Then together they wrote various details without saying the movie name and type of the movie and had their classmate guessed.

Step 2: Representatives of each group read out message. Their classmates try to guess the movie name and type of movie. If nobody guesses right, the representative will tell them the answer.

Step 3: Discussion of concept. Representatives of each group come out to read the movie names and choose a sentence that is the key point as well as write the vocabulary they thought would enable their classmates to correctly name the movie. The students then had to come out to the front and write down the movie name under the words. The researchers had

students express their opinions and identify the type of movie. The students together look at the picture and identify the type of movie.

Step 4: Summary of concepts. Students play game; each representative watch the movie, try to guess the movie name and tell the type of movie.

Learning Unit 3: Adventure

Step 1: Creation of situation. The students were divided into groups and given situation. The students were traveling and come across a storm that leads to the students being stranded in an island. Together, students think of how to survive.

Step 2: Students present their work by placing words on the board with only a word being used once.

Step 3 Discussion of concept. The researchers checked the spellings of each vocabulary and supplement sentence structure. *What are they doing? They are building fire.* Students listened to "Survive in the Wild" and summarized the main points by using questions. In addition, the researchers added vocabulary by having students look at a monitor with words and had them pronounce the words correctly.

Step 4 Summarization of concept. Students had to fill-in verbs related to nouns such as …….*chop* ……wood ……*make or build*…….*fire*. The researchers had placed vocabulary from step 1 onto the board and students corrected them.

1.2 Observation stage

All 7 lesson plans were implemented and students' behavior recorded. From the reflection records and classroom management evaluation forms, it was found that presenting open-ended problems and doing group work can encourage students to learn new vocabulary and use them to create sentences with meaning. Students were able to do a variety of household chores, remember vocabulary well when there were pictures included with the picture guessing game, household chores or looking at pictures and writing the vocabulary for the Survival skill plan. Students had interest in the movies shown on the monitor and helped each other answer. Students were able to connect mathematics, which was calculating the percentage with the activity that involved the vocabulary group of always, usually, often, sometimes, rarely, and never by comparing the amount of days they completed the chores. For example, I do the chores everyday means doing chores 7 days a week, therefore always must be used.

In the learning unit TV and films, the researchers had students compared films. Fantasy and war, adventure and romantic comedy: leading to students being able to remember vocabulary faster from doing exercises. Students could summarize the concepts from when the researchers had students analyzed the definitions or meaning of films by observing important words such as *A program in which famous people talk about themselves and their work*. Most students answered correctly as *chat show / talk show*. In the discussion and extension of concept step, students together separate vocabulary in the feeling and emotions plan. The researchers had divided the board into three parts and the words *happy*, *sad* and *shy* were placed on the board. Students had to stick the vocabulary from their own group onto the board until students were able to conclude that the vocabulary were divided into *positive*, *negative* and *both*.

1.3 Reflection stage

From the reflection records and classroom management evaluation forms, it was found that in the situation step, some students in the group could not understand the instructions and some students were not sure how many words or sentences they had to write. The researchers should call for the representatives for each group to pick up the equipment and ask again to make sure that they understood the instructions. In the Household chores learning unit, questions that urge students to connect them to household chores which is *How*

does it look like?, added the pronunciation to two times of the Household chores pictures and students should be randomly selected to pronounce words to make sure that they were able to correctly pronounce the words. In the pictures guessing game, the researchers should ready general questions to ask students since many students wished to answer and students will also pay more attention to the questions. The researchers should have students answer in sentences so that students can better understand the sentence structure. *Mop the floor* should be changed to *Mary mops the floor*. The teaching method should be changed from saying if the subject is singular, then the verb must add an "s" to the sentences that use plural, singular subject and had students analyzed what verb must follow. In the Family Member's Duties lesson plan in the discussion of concept step, students should write sentences that use the word group *often, sometimes, always, never, rarely, usually*. There should be examples for students to analyze the correct structure. In the TV programmers lesson plan, more vocabulary should be added which are *Kids program, Cooking program, Drama/Soap opera* and *Variety show* to cover all the content. Students were rather confused between *reality, variety* and *games show*. There should be more Thai and foreign examples so that students would better understand. In the survival skill lesson plan, the vocabulary should be divided since the teaching duration was long and the students' interest was lower than what was expected. The vocabulary should be categorized for easier remembering by separating them into *Food, Shelter, Equipment and Survival skill*. In the situation step, the subject should be changed from Tom to you and your friends so that students will think of the situation as their own. In the summarization step, add activities for students to speak from pictures by showing pictures of people and activities so that they could survive. It is to train students to use the sentence structure *He is chopping the wood*. In the Feeling/Emotions lesson plan, pictures of people showing various expressions should be changed to conversations of LINE, which will be more interesting since students are used to using cartoons to show their expressions. Said learning management is in accordance to Center for Research in Mathematics Education (CRME), Kon Kaen University (2006) which said that the 4 steps was what made Japanese education a success. In open approach, students work together as a group, think together and have roles in presenting ideas by speaking. This would lead to students being able to remember content from practice and teachers have summarized the students' concepts again, allowing them to better understand the content. This is in accordance with Paijit Baanlau (2008) who had studied Developing Critical Thinking Skill by using Open Approach teaching methods with Matthauomsuka 1 students. Research results found that the students' achievement all passed the criterion of 70 with a score of 77.55 percent of the total score. A total of 85.00 percent passed the criterion which equals to 70 of all students passed the criterion.

Students' writing skill score using lesson study and open approach in English language subject for grade 8 students of Khon Kaen Demonstration School (Modindang) had a mean score of 44.40 percent that passed the criterion and the number of students which passed the mean score criterion was 23 students (65.71 percent). Said results were due to the use of the lesson study learning process. The researchers and participating researchers had created the lesson plans systematically according to the objective in the lesson plans. Media that were diverse and interesting, implementing the lesson plans and fixing the lesson plans according to the evaluation forms as well as open approach, students must together try to solve the problem. There was exchange in work and continuous use of writing skills in each lesson plan. For example, writing various activities done at home, writing the content that identifies the activities done on Sunday, creating sentences, and the use of the word group *often, sometimes, always, never, rarely, usually*. In addition, students together write conversation in the topic of survival from the situation decided by their own group. In accordance with Tinnakorn Pringpoh (2002) who had studied The Learners' Learning Method

to Write by Applying Task-Based Writing Activities. The target group was 10 secondary high school students by purposive sampling. The teaching models were 2 controlled writing activity models which were Parallel writing task and Descriptive writing task. Research instruments used in data collection were learners' behavior observation form, and learners' writing evaluation form. The research results found that in practice when using the same design, learners used 9 learning strategies. When in practice, learners use descriptive type, learners use 7 learning strategies that are found most often which are working alone, working with others and asking for help from teachers. Learners have more trust, which is in accordance with Abidin (1997) who studied A Task-Based Approach to Project Work. The project is part of task-based approach in learning, which gives importance to cooperation of the learners. This research study was conducted by Universiti Sains in Malaysia, using 6 classrooms with around 24 people in each class. Each class was divided into groups of 4-5 people. The duration of the experiment was 14 weeks. Ten weeks were spent on completing the project. In each week, they learn English in class for 4 hours and 1 hour for doing project activities. Learners must use time out of class to complete work. The results found that completing the project enables learners to have fun, be excited and challenged. It is a response to the needs of learners; learning by using real situations that can be used to communicate in real life.

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A Study of Problems in English Communication of Information Technology Students

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Abstract

The purposes of this research were 1) to study problems in English communication of Information Technology students and 2) to compile opinions and suggestions concerning problems in English communication of Information Technology students.

Research samples were 291 Information Technology students at Thai-Nichi Institute of Technology in 2016 academic year, derived through simple random sampling technique. The instruments used for gathering the data were the rating-scale and open-ended questionnaire. The statistics used for analyzing the data were frequency, percentage, mean, standard deviation, and content analysis.

Research findings were as follows:

1. Information Technology students had a moderate level of problems in English communication, when considered in each aspect. It was found that *listening, speaking* were at low level. For reading and writing, it was at moderate level.

2. TNI students had various suggestions such as; reading skill should be taught in extra class; teachers should teach writing in various styles; Learning through Facebook should be utilized.

Keywords: *Problems in English Communication*

Introduction

English language is central for communication in a variety of contexts such as political, economic, social, educational, cultural, and for tourism (Canale, 1983). Currently, English in Thailand has been accepted as an international language. Thai students learn English through childhood in school until university. The English language is significant for roles in the daily life. Also, knowing English gives a chance to obtain a good job, and is vital to understand other cultures. English is the primary language and it has become almost a necessity for people, if they want to work in global workplaces (Rubin, 2005).

The problems from the lack of language skills may cause misunderstandings in communication between Thai people and foreigners because they use different languages. Furthermore, it may even lead to the failure in their communication. The ability to communication well can enhance success in their work (Swan, 2008).

In this study the researcher surveyed with Information Technology students at Thai-Nichi Institute of Technology. The results of this research will be used for improving instruction and developing teaching materials in English classes to be highly efficient.

Research purposes

1) To study problems in English communication of Information Technology students and

2) To compile opinions and suggestions concerning problems in English communication of Information Technology students.

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Methodology

Population and Samples

This research was to study problems in English communication of Information Technology students in four aspects: listening, speaking, reading, and writing which consisted of population and samples as follows:

Population of this research was 1,200 TNI students Information Technology in 2016 academic year. Samples of the research were 291 TNI students derived through simple random sampling technique. The instruments used for gathering the data were the rating-scale and open-ended questionnaire. The statistics used for analyzing the data were frequency, percentage, mean, standard deviation and content analysis.

Instrumentation

The instrument used in this study is a questionnaire. The questionnaire was constructed by the researcher based on problems in English communication of Information Technology students.

The first part (Part 1) of this questionnaire asks for the demographic information on their genders and academic year. The participants were asked to report their information by ticking in only one box.

The second part (Part 2) concerns problems in English communication of Information Technology students. This part comprises 24 items of problems in English communication of Information Technology students in 4 major areas: 3 items of listening, 6 items of speaking, 8 items of reading, and 7 items of writing. The participants were asked to check by ticking in only one box under the five levels of importance on each item in Part 2 to indicate their problems in English communication in each area listed in the questionnaire. Reliability is defined as the proportion of the alpha is a lower bound of the true reliability of the research instrument or the questionnaire. The descriptive statistics is also used to determine the individual summary statistics for each of the 24 items in the questionnaire.

The third part (Part 3) asks for more opinions and suggestions of Information Technology students about problems in English communication which based on open-ended questions.

Data collection

Problems in English communication of Information Technology students were accessed through the questionnaire in 2016 academic year.

The administration of the research questionnaire was conducted in English classes. Part 1 concerns the demographic variables about their genders and academic years. The 24 items of Part 2 cover problems in English communication of Information Technology students. Therefore, the participants were requested to consider each item carefully and indicate how important each item was for their study. A total of 291 Information Technology students completed the questionnaire.

The analyses of the research data were conducted by means of descriptive statistics. Responses were employed to report their demographic variables and to indicate the rank order of the items in each area of problems in English communication listed in the questionnaire. The frequency distributions were analyzed to determine the proportions of the levels of importance on the 24 items in 4 major areas.

Data Analysis from Questionnaire

Data analysis from questionnaire both single item and whole questionnaire which presented a form of rating scale. These rating scales were calculated to find out mean and standard deviation and then translated based on criteria developed by Best (1977) as follows:

1.00 <= $\bar{x}$< 1.50 refers to Information Technology students have problems in English communication at the lowest level.

1.51 <= $\bar{x}$ < 2.50 refers to Information Technology students have problems in English communication at low level.

2.51 <= $\bar{x}$< 3.50 refers to Information Technology students have problems in English communication at moderate level.

3.51 <= $\bar{x}$< 4.50 refers to Information Technology students have problems in English communication at high level.

4.51 <= $\bar{x}$< 5.00 refers to Information Technology students have problems in English communication at the highest level.

The statistics used for analyzing the data

The collected data was analyzed using a computer program. The statistics used for analyzing the data were frequency, percentage, mean, standard deviation, and content analysis.

Results

Results of Data Analysis

Phase 1: The results of demographic variable of Information Technology students in the 2016 academic year is presented in the first section deals with genders and academic years as following table.

Table 1: Table of the results of demographic data of respondents

Demographic data of respondents	**n=291**	**Percentage**
1. Gender		
1.1 Male	175	60.13
1.2 Female	116	39.87
Total	**291**	**100**
2. Academic Year		
2.1 First Year	93	31.95
2.2 Second Year	78	26.80
2.3 Third Year	66	22.68
2.4 Forth Year	54	18.57
Total	**291**	**100**

Table showed that percentages of respondents in genders ranged from 60.13% for male and 39.87% for female; in academic years ranged from 31.95% for 1st year, 26.80% for 2nd year, 22.68% for 3rd year, and 18.57% for 4th year.

Phase 2: Problems in English communication of Information Technology students

Table 2: Table of mean and standard deviation of problems in English communication of Information Technology students in total and in each aspect

Components	$\bar{x}$	S.D.	Level
Listening Skills	1.68	0.85	Low
Speaking Skills	1.89	0.67	Low
Reading Skills	3.49	0.96	Moderate
Writing Skills	3.21	0.86	Moderate
Total	**2.56**	**0.83**	**Moderate**

The table above indicated that Information Technology students had a moderate level of problems in English communication in overall ($\bar{x}$=2.56), when considered in each aspect, it was found that the students had low levels of problems in English communication in listening ($\bar{x}$=1.68) and speaking ($\bar{x}$=1.89). Furthermore, it was at moderate level in reading ($\bar{x}$=3.49) and writing ($\bar{x}$=3.21) respectively.

Table 3: Table of mean and standard deviation of problems in English communication of Information Technology students in the area of listening skills in overall and in each item

Listening skills	$\bar{x}$	S.D.	Level
1) Inability to understand English presentations or discussions.	1.88	0.79	Low
2) Inability to understand long conversations.	1.65	0.91	Low
3) Inability to understand any information from speakers.	1.51	0.85	Low
Total	**1.68**	**0.85**	**Low**

The table above indicated that Information Technology students had a low level of problems in English communication in listening skills in overall ($\bar{x}$=1.68), when considered in each item, it was found that all items were at low level.

Table 4: Table of mean and standard deviation of problems in English communication of Information Technology students in the area of speaking skills in overall and in each item

Speaking skills	$\bar{x}$	S.D.	Level
1) Inability to make an oral presentation.	1.89	0.66	Low
2) Inability to construct oral sentences in a limited time.	1.76	0.78	Low
3) Anxiety related to miscommunication.	1.97	0.62	Low
4) Limited English vocabulary.	1.79	0.63	Low
5) Inability to communicate properly.	1.88	0.74	Low
6) Inability to pronounce English clearly and correctly.	2.05	0.59	Low
Total	**1.89**	**0.67**	**Low**

The table above indicated that Information Technology students had a low level of problems in English communication in speaking skills in overall ($\bar{x}$=1.89), when considered in each item, it was found that all items were at low level.

Table 5: Table of mean and standard deviation of problems in English communication of Information Technology students in the area of reading skills in overall and in each item

Reading skills	$\bar{x}$	S.D.	Level
1) Inability to find the main ideas.	3.38	1.16	moderate
2) Inability to use scanning technique.	3.44	0.87	moderate
3) Inability to use detailed reading technique.	3.58	0.82	high
4) Inability to use skimming technique.	3.51	1.17	high
5) Inability to guess meaning from the context.	3.47	0.89	moderate
6) Inability to identify the tone of passages or articles.	3.33	0.87	moderate
7) Inability to understand technical terms in passages or articles.	3.66	0.85	high
8) Inability to understand whole passages or articles.	3.55	1.05	high
Total	**3.49**	**0.96**	**moderate**

The table above indicated that Information Technology students had a moderate level of problems in English communication in reading skills in overall ($\bar{x}$=3.49), when considered in each item, it was found that the highest item were item7 *Inability to understand technical terms in passages or articles* ($\bar{x}$=3.66), and item3 *Inability to use detailed reading technique* ($\bar{x}$=3.58). The lowest item were item6 *Inability to identify the tone of passages or articles* ($\bar{x}$=3.33), and item1 *Inability to find the main ideas* ($\bar{x}$=3.38) respectively.

Table 6: Table of mean and standard deviation of problems in English communication of Information Technology students in the area of writing skills in overall and in each item

Writing skills	$\bar{x}$	S.D.	Level
1) Inability to use punctuation correctly.	3.15	0.88	moderate
2) Inability to spell words correctly.	3.24	0.86	moderate
3) Inability to write more complicated structures.	3.01	0.96	moderate
4) Inability to use vocabulary in different contexts.	3.27	0.74	moderate
5) Inability to write a paragraph or more.	3.29	0.81	moderate
6) Inability to express opinions effectively when writing.	3.18	0.92	moderate
7) Inability to convey messages to readers.	3.33	0.85	moderate
Total	**3.21**	**0.86**	**moderate**

The table above indicated that Information Technology students had a moderate level of problems in English communication in writing skills in overall ($\bar{x}$=3.21), when considered in each item, it was found that all items were at moderate level.

Phase 4: The results of suggestions of Information Technology students about problems in English communication as following:

1) Reading skill should be taught in extra class.
2) Teachers should teach writing in various styles.
3) Learning through Facebook or social network should be utilized.

Conclusions

According to the study and data analysis, the results of this study were concluded as follows:

1. Information Technology students had a moderate level of problems in English communication, when considered in each aspect. It was found that *listening, speaking* were at low level. For reading and writing, it was at moderate level.

2. TNI students had various suggestions such as; reading skill should be taught in extra class; teachers should teach writing in various styles; Learning through Facebook should be utilized.

Discussion

According to the study and data analysis the results of this study could be discussed as follows.

The results of problems in English communication of Information Technology students in overall were at moderate level ($\bar{x}$=2.56). It might be because Information Technology students used communication strategies continuously in their learning. Moreover, they were taught these strategies in the classroom. This is related with the idea of Rubin (1990) who advocated that communication strategies should be taught continuously. The communication strategies use to promote more effective language learning. In addition, if students do not select strategies in the service of tasks, skills, and goals, they might not easily find the most appropriate strategies and be successful language learners (Gu 2003; Oxford et al. 2004). Therefore, more effectiveness could be obtained if both process and product were integrated in the teaching methods. As a result, strategic competence and language-skills development can be supported by a particular learning system in which students can cultivate their ability to choose appropriate strategies and be more successful (Rubin et al. 2007).

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A Study of TOEIC Vocabulary Learning Strategies of TNI Students

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Abstract

The purposes of this research were 1) to study TOEIC vocabulary learning strategies of TNI students and 2) to compile opinions and suggestions concerning TOEIC vocabulary learning strategies of TNI students.

Research samples were 357 undergraduate students at Thai-Nichi Institute of Technology in 2016 academic year, derived through simple random sampling technique. The instruments used for gathering the data were the rating-scale and open-ended questionnaire. The statistics used for analyzing the data were frequency, percentage, mean, standard deviation, and content analysis.

Research findings were as follows:

1. TNI students had a high level of TOEIC vocabulary learning strategies using, when considered in each aspect. It was found that *strategies to discover the meaning of new vocabulary, strategies to retain the knowledge of newly-learned vocabulary, and strategies to expand the knowledge of new vocabulary* were at high level.

2. TNI students had various suggestions such as; TOEIC vocabulary learning strategies should be applied in undergraduate class to activate the learners in vocabulary learning, teachers should teach vocabulary learning strategies with TOEIC learning in classroom.

Keywords: *TOEIC Vocabulary Learning Strategies*

Introduction

Vocabulary knowledge plays a significant role in learning English as a second language. It is a crucial part of language learning and teaching and communication. Furthermore, vocabulary teaching has not been receptive to problems in the area, and most language teachers have not fully recognized the great communicative advantage in developing an extensive vocabulary (McCarthy, 1990). Vocabulary often seems to be the least systematized and the least accepted for of all the aspects of learning a foreign language, such as listening, speaking, reading, writing, grammar, or even pronunciation (Read, 2000).

The teaching and learning of vocabulary has never stimulated the same degree of interest within language teaching as grammatical competence, contrastive analysis, reading, writing, phonology or discourse analysis which have received considerable attention from teachers. This is related to the idea of Hedge (2000) who advocated that an important reason for the abandon of vocabulary that learners themselves do not place considerable significance on vocabulary. Language teachers have been told a great agreement about new discoveries in English grammar, but they have heard much less about ways to assist students learn new words. Additionally, the meanings of words could not be sufficiently taught, so it is better not to try to teach them (Allen 1983).

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In this study the researcher surveyed with undergraduate students at Thai-Nichi Institute of Technology. The results of this research will be used for improving instruction and developing teaching materials in English classes to be highly efficient.

Methodology

Population and Samples

This research was to study study TOEIC vocabulary learning strategies of TNI students in three aspects: *strategies to discover the meaning of new vocabulary, strategies to retain the knowledge of newly-learned vocabulary, and strategies to expand the knowledge of new vocabulary* which consisted of population and samples as follows:

Population of this research was 5,000 TNI students in 2016 academic year. Samples of the research were 357 TNI students derived through simple random sampling technique. The instruments used for gathering the data were the rating-scale and open-ended questionnaire. The statistics used for analyzing the data were frequency, percentage, mean, standard deviation and content analysis.

Instrumentation

The instrument used in this study is a questionnaire. The questionnaire was constructed by the researcher based on TOEIC vocabulary learning strategies of TNI students.

The first part (Part 1) of this questionnaire asks for the demographic information on their genders and academic year. The participants were asked to report their information by ticking in only one box.

The second part (Part 2) concerns TOEIC vocabulary learning strategies of TNI students. This part comprises 30 items of TOEIC vocabulary learning strategies of TNI students in 3 major areas: 10 items of *strategies to discover the meaning of new vocabulary*, 10 items of *strategies to retain the knowledge of newly-learned vocabulary*, and 10 items of *strategies to expand the knowledge of new vocabulary*. The participants were asked to check by ticking in only one box under the five levels of importance on each item in Part 2 to indicate their TOEIC vocabulary learning strategies in each area listed in the questionnaire. Reliability is defined as the proportion of the alpha is a lower bound of the true reliability of the research instrument or the questionnaire. The descriptive statistics is also used to determine the individual summary statistics for each of the 30 items in the questionnaire.

The third part (Part 3) asks for more opinions and suggestions of TNI students about TOEIC vocabulary learning strategies which based on open-ended questions.

Data collection

TOEIC vocabulary learning strategies of TNI students were accessed through the questionnaire in 2016 academic year.

The administration of the research questionnaire was conducted in English classes. Part 1 concerns the demographic variables about their genders and academic years. The 30 items of Part 2 cover TOEIC vocabulary learning strategies of TNI students. Therefore, the participants were requested to consider each item carefully and indicate how important each item was for their study. A total of 357 TNI students completed the questionnaire.

The analyses of the research data were conducted by means of descriptive statistics. Responses were employed to report their demographic variables and to indicate the rank order of the items in each area of TOEIC vocabulary learning strategies listed in the questionnaire. The frequency distributions were analyzed to determine the proportions of the levels of importance on the 30 items in 3 major areas.

Data Analysis from Questionnaire

Data analysis from questionnaire both single item and whole questionnaire which presented a form of rating scale. These rating scales were calculated to find out mean and standard deviation and then translated based on criteria developed by Best (1977) as follows:

1.00 <= $\bar{x}$< 1.50 refers to TNI students have TOEIC vocabulary learning strategies at the lowest level.

1.51 <= $\bar{x}$ < 2.50 refers to TNI students have TOEIC vocabulary learning strategies at low level.

2.51 <= $\bar{x}$< 3.50 refers to TNI students have TOEIC vocabulary learning strategies at moderate level.

3.51 <= $\bar{x}$< 4.50 refers to TNI students have TOEIC vocabulary learning strategies at high level.

4.51 <= $\bar{x}$< 5.00 refers to TNI students have TOEIC vocabulary learning strategies at the highest level.

The statistics used for analyzing the data

The collected data was analyzed using a computer program. The statistics used for analyzing the data were frequency, percentage, mean, standard deviation, and content analysis.

Results

Results of Data Analysis

Phase 1: The results of demographic variable of TNI students in the 2016 academic year is presented in the first section deals with genders and academic years as following table.

Table 1: Table of the results of demographic data of respondents

Demographic data of respondents	**n=291**	**Percentage**
1. Gender		
1.1 Male	144	40.33
1.2 Female	213	59.67
Total	**357**	**100**
2. Academic Year		
2.1 First Year	112	31.37
2.2 Second Year	100	28.02
2.3 Third Year	77	21.56
2.4 Forth Year	68	19.05
Total	**357**	**100**

Table showed that percentages of respondents in genders ranged from 59.67% for female and 40.33% for male; in academic years ranged from 31.37% for 1st year, 28.02% for 2nd year, 21.56% for 3rd year, and 19.05% for 4th year.

Phase 2: TOEIC vocabulary learning strategies of TNI students

Table 2: Table of mean and standard deviation of TOEIC vocabulary learning strategies of TNI students in total and in each aspect

Components	$\bar{x}$	S.D.	Level
Strategies to discover the meaning of new vocabulary	4.47	0.72	high
Strategies to retain the knowledge of newly-learned vocabulary	4.41	0.69	high
Strategies to expand the knowledge of new vocabulary	4.39	0.77	high
Total	**4.42**	**0.72**	**high**

The table above indicated that TNI students had a high level of TOEIC vocabulary learning strategies in overall ($\bar{x}$=4.42), when considered in each aspect, it was found that the students had high levels of TOEIC vocabulary learning strategies in all aspect.

Table 3: Table of mean and standard deviation of TOEIC vocabulary learning strategies of TNI students in the area of *Strategies to discover the meaning of new vocabulary* in overall and in each item

Listening skills	$\bar{x}$	S.D.	Level
1) Guess the meaning from a single vocabulary item to discover the meaning of new vocabulary items	4.55	0.77	highest
2) Guess the meaning from contexts to discover the meaning of new vocabulary items	4.39	0.69	high
3) Guess the meaning from word classes, such as nouns, verbs, adjectives, adverbs, to discover the meaning of new vocabulary items	4.37	0.67	high
4)Guess the meaning from grammatical structure of a sentence to discover the meaning of new vocabulary items	4.39	0.86	high
5) Guess the meaning by analysing the structure of words (prefixes, roots, and suffixes) to discover the meaning of new vocabulary items	4.49	0.73	high
6) Guess the meaning from real situations to discover the meaning of new vocabulary items	4.38	0.71	high
7) Guess the meaning from gestures to discover the meaning of new vocabulary items	4.66	0.69	highest
8) Use an English-English dictionary to discover the meaning of new vocabulary items	4.54	0.67	highest
9) Ask classmates or friends to discover the meaning of new vocabulary items	4.49	0.72	high
10) Ask teachers of English to discover the meaning of new vocabulary items	4.44	0.69	high
Total	4.47	0.72	high

The table above indicated that TNI students had a high level of TOEIC vocabulary learning strategies in the area of *Strategies to discover the meaning of new vocabulary* in overall ($\bar{x}$=4.47), when considered in each item, it was found that the highest item was item 7 *guess the meaning from gestures to discover the meaning of new vocabulary items* ($\bar{x}$=4.66), item 1 *Guess the meaning from a single vocabulary item to discover the meaning of new vocabulary items* ($\bar{x}$=4.55), and item 8 *use an English-English dictionary to discover the meaning of new vocabulary items* ($\bar{x}$=4.55). For the rest, it was found that level of TOEIC vocabulary learning strategies in this area was at high level.

Table 4: Table of mean and standard deviation of TOEIC vocabulary learning strategies of TNI students in the area of *Strategies to retain the knowledge of newly-learned vocabulary* in overall and in each item

Speaking skills	$\bar{x}$	S.D.	Level
1) Say vocabulary items in sentences repeatedly to retain the knowledge of newly-learned vocabulary items	4.44	0.78	high
2) Listen an English conversation of other people (classmates, friends, teachers, native speakers of English) to retain the knowledge of newly learned vocabulary items	4.39	0.74	high
3) Use vocabulary items to converse with classmates or friends	4.41	0.69	high
4) Use vocabulary items to converse with teachers of English to retain the knowledge of newly learned vocabulary items	4.51	0.66	highest
5) Look at words' affixes (prefixes and suffixes) to retain the knowledge of newly-learned vocabulary items	4.57	0.59	highest
6) Make a vocabulary list with meanings and examples in one's notebook to retain the knowledge of newly-learned vocabulary items	4.41	0.74	high
7) Write vocabulary items with meanings on papers and stick them in one's bedroom to retain the knowledge of newly-learned vocabulary items	4.36	0.64	high
8) Group vocabulary items according to the synonyms and antonyms to retain the knowledge of newly-learned vocabulary items	4.37	0.69	high
9) Associate pictures to vocabulary items to retain the knowledge of newly-learned vocabulary items	4.29	0.71	high
10) Use semantic maps to retain the knowledge of newly-learned vocabulary items	4.35	0.66	high
Total	4.41	0.69	high

The table above indicated that TNI students had a high level of TOEIC vocabulary learning strategies in the area of *Strategies to retain the knowledge of newly-learned vocabulary* in overall ($\bar{x}$=4.41), when considered in each item, it was found that the highest item was item 5 *Look at words' affixes (prefixes and suffixes) to retain the knowledge of newly-learned vocabulary items* ($\bar{x}$=4.57) and item 4 *Use vocabulary items to converse with teachers of English to retain the knowledge of newly learned vocabulary items* ($\bar{x}$=4.51). For the rest, it was found that level of TOEIC vocabulary learning strategies in this area was at high level.

Table 5: Table of mean and standard deviation of TOEIC vocabulary learning strategies of TNI students in the area of *Strategies to expand the knowledge of new vocabulary* in overall and in each item

Reading skills	$\bar{x}$	S.D.	Level
1) Listen to English songs to expand the knowledge of vocabulary	4.31	0.79	high
2) Listen to English radio programmes to expand one's knowledge of vocabulary	4.28	0.83	high
3) Converse with teachers of English in English to expand the knowledge of vocabulary	4.59	0.71	highest
4) Read English articles from different sources, such as texts, newspaper, brochures, leaflets, to expand the knowledge of vocabulary	4.57	0.69	highest
5) Study vocabulary items from advertisements, public relations notices, traffic signs, etc. To expand the knowledge of vocabulary	4.33	0.85	high
6) Watch English programme channels on TV to expand the knowledge of vocabulary	4.54	0.77	highest
7) Watch an English-speaking films with subtitles to expand the knowledge of vocabulary	4.22	0.73	high
8) Play English games, such as scrabble, crossword puzzles, to expand the knowledge of vocabulary	4.31	0.81	high
9) Practise using a dictionary regularly to expand the knowledge of vocabulary	4.32	0.79	high
10) Take an extra job at tour offices, hotels, etc. to expand the knowledge of vocabulary	4.43	0.73	high
Total	4.39	0.77	high

The table above indicated that TNI students had a high level of TOEIC vocabulary learning strategies in the area of *Strategies to expand the knowledge of new vocabulary* in overall ($\bar{x}$=4.39), when considered in each item, it was found that the highest item was item 3 *Converse with teachers of English in English to expand the knowledge of vocabulary* ($\bar{x}$=4.59), item 4 *Read English articles from different sources, such as texts, newspaper, brochures, leaflets, to expand the knowledge of vocabulary* ($\bar{x}$=4.57), and item 6 *Watch English programme channels on TV to expand the knowledge of vocabulary* ($\bar{x}$=4.54). For the rest, it was found that level of TOEIC vocabulary learning strategies in this area was at high level.

Phase 4: The results of suggestions of TNI students about TOEIC vocabulary learning strategies as following:

1) TOEIC vocabulary learning strategies should be applied in undergraduate class to activate the learners in vocabulary learning.

2) Teachers should teach vocabulary learning strategies with TOEIC learning in classroom.

Conclusions

According to the study and data analysis, the results of this study were concluded as follows:

1. TNI students had a high level of TOEIC vocabulary learning strategies using, when considered in each aspect. It was found that *strategies to discover the meaning of new vocabulary, strategies to retain the knowledge of newly-learned vocabulary, and strategies to expand the knowledge of new vocabulary* were at high level.

2. TNI students had various suggestions such as; TOEIC vocabulary learning strategies should be applied in undergraduate class to activate the learners in vocabulary learning, teachers should teach vocabulary learning strategies with TOEIC learning in classroom.

Discussion

According to the study and data analysis the results of this study could be discussed as follows.

The results of using TOEIC vocabulary learning strategies of TNI students in overall were at high level ($\bar{x}$ =4.42). It might be because TNI students used TOEIC vocabulary learning strategies continuously in their learning. Moreover, they applied learning strategies about guessing the meaning of words presented in context in daily life learning. This is related with the idea of Thornbury (2002) who advocated that an effective strategy for learning vocabulary items is guessing the meaning of words presented in context. Likewise, testing vocabulary items should be tested through the context of the sentence related to the aspects of what represent of knowing a word. Moreover, Read (2000) stipulated that language learners who were presented with the words in an affluent context were significantly better at guessing what they meant than those who did not have the advantage of contextual clues.

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A Study of Using TNI Core Values "KM-HR-HoP" of First Year Undergraduate TNI Students

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Abstract

The purposes of this research were 1) to study using of TNI core values "KM-HR-HoP" of first year undergraduate TNI students and 2) to gather opinions and suggestions concerning TNI core values "KM-HR-HoP" of TNI students.

Research samples were 322 first year undergraduate students at Thai-Nichi Institute of Technology in 2016 academic year, derived through simple random sampling technique. The instruments used for gathering the data were the rating-scale and open-ended questionnaire. The statistics used for analyzing the data were frequency, percentage, mean, standard deviation, and content analysis.

Research findings were as follows:

1. TNI students had a high level of TNI core values "KM-HR-HoP" using, when considered in each aspect. It was found that *Kaizen, Monodzukuri, Hansei, Respect, and Honest were* at high level. For *Public Interest*, it was at moderate level.

2. TNI students had various suggestions such as; the six essential TNI core values should be advised in the classroom; public interest should be promoted in Thai society to support students in considering the importance of public interest.

Key words: *TNI Core Values, KM-HR-HoP Japanese Style*

Introduction

Thai-Nichi Institute of Technology has an uncompromising commitment to develop graduates for quality and potential. In order to have the expertise in the field of foreign language proficiency, the graduates can develop about a virtuous, ethical, responsible and socially responsible graduate. It is a potential human resource that is internationally competitive and a key contributor to the development of the country, especially the Thai industrial sector.

In instructional management, TNI maintains Monodzukuri as a guideline for teaching and learning in all disciplines so that students have the skills of the hard skills of each subject along with the skills. Moreover, social skills (soft skills) such as a language skill, a communication skill, teamwork a discipline, punctuality, and a reputation are significant.

There are six popular way of teaching to enhance the behavior and characteristics of the TNI graduates to be outstanding under the concept of "KM-HR-HoP", which consists of Kaizen, Monodzukuri, Hansei, Respect, Honest, and Public Interest. Furthermore, Bandhit Rojarayanont (2016) advocated that the essential core values which used in cultivating to students' idea called the TNI Core Values (KM-HR-HoP) as following;

1. KAIZEN (Continuous improvement)
2. MONOZUKURI (Being able to think and do by oneself)
3. HANSEI (Self-Reflection means considering and improving oneself first)
4. RESPECT (Honor yourself and others)
5. HONEST (Sincere, not corrupt, not take advantage of others)
6. PUBLIC-INTEREST CONSCIOUS (Awareness to public interest).

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In addition, using TNI core values is important to develop the students to have more responsibilities to oneself and to others in society. However, the TNI students need to have the aims in learning which motivation in learning is a main key to approach to the targets (Edge, 1993). Thus, motivation emphasizes basic human need, which is replaced by 'goal' in the current research. It is like an inspiration to drive the process of successful action (Dornyei, 2001).

In conclusion, the researcher created a questionnaire to gather opinions the TNI students about TNI core values and application this method in daily life of undergraduate student at TNI in 2016 academic year and the results derived from research will be guideline in improvement and development instruction and learners' development in next occasions.

Research Purposes

1) to study using of TNI core values "KM-HR-HoP" of first year undergraduate students
2) to gather opinions and suggestions concerning TNI core values "KM-HR-HoP" of TNI students.

Methodology

Population and Samples

This research was to study using of TNI core values "KM-HR-HoP" of first year undergraduate TNI students in six aspects: Kaizen, Monodzukuri, Hansei, Respect, Honest, and Public Interest which consisted of population and sample as follows:

Population of this research was 2,000 TNI students in 3 faculties; Engineering, Information Technology, and Business Administration in 2016 academic year.

Samples of this research were 322 TNI students derived through Simple Random Sampling technique.

Instrumentation

The instrument used in this study is a questionnaire. The questionnaire was constructed by the researcher, based on six TNI core values "KM-HR-HoP" of first year undergraduate students. This research questionnaire was used to identify six TNI core values; Kaizen, Monodzukuri, Hansei, Respect, Honest, and Public Interest of the undergraduate students at Thai-Nichi Institute of Technology. In addition, this questionnaire was employed as a research instrument for data collection based on an ordinal-scale measurement of six TNI core values of Thai-Nichi Institute of Technology students.

The first part (Part 1) of this questionnaire asks for the demographic information on their genders and faculties. Part 2 deals with six TNI core values used by Thai-Nichi Institute of Technology students.

The third part (part 3) asks for more suggestions and opinions of TNI undergraduate students about six TNI core values which based on opened end questions.

Data Collection

Using six TNI core values "KM-HR-HoP" of Thai-Nichi Institute of Technology students was accessed through the questionnaire in 2016 academic year.

The administration of the research questionnaire was conducted in languages classes. Part 1 concerns the demographic variables about their genders and faculties. The 30 items of Part 2 covers six TNI core values of Thai-Nichi Institute of Technology students. Therefore,

the participants were requested to consider each item carefully and indicate how important each item was for their study. A total of 322 TNI students from the 3 faculties completed the questionnaires.

Data Analysis from Questionnaire

Data analysis from questionnaire both single item and whole questionnaire which presented a form of rating scale. These rating scales were calculated to find out mean and standard deviation and then translated based on criteria developed by Best (1977) as follows:

1.00 <= $\bar{x}$< 1.50 refers to TNI students use six TNI core values "KM-HR-HoP" at the lowest level.

1.51 <= $\bar{x}$ < 2.50 refers to TNI students use six TNI core values "KM-HR-HoP" at low level.

2.51 <= $\bar{x}$< 3.50 refers to TNI students use six TNI core values "KM-HR-HoP" at moderate level.

3.51 <= $\bar{x}$< 4.50 refers to TNI students use six TNI core values "KM-HR-HoP" at high level.

4.51 <= $\bar{x}$< 5.00 refers to TNI students use six TNI core values "KM-HR-HoP" at the highest level.

The statistics used for analyzing the data

The collected data was analyzed using computer program. The statistics used for analyzing the data were frequency, percentage, mean, standard deviation, and content analysis.

Results

Results of Data Analysis

Phase 1: The results of demographic variables of TNI undergraduate students.

The analysis of the data from the student questionnaire reported by TNI undergraduate students in the 2016 academic year was presented in the first section deals with the demographic variables from the students' responses to Part 1 of the questionnaire: genders and faculties as following table.

Table 1: Table of the results of demographic data of respondents

Demographic data of respondents	**n**	**Percentage**
1. Gender		
1.1 male	149	46.27
1.2 female	173	53.73
Total	**322**	**100**
2. Faculty		
2.1 Engineering	105	32.60
2.2 Information Technology	98	30.43
2.3 Business Administration	119	36.95
Total	**322**	**100**

Table shows that the percentages of the TNI undergraduate respondents in gender ranged from 53.73 % for female and 46.27% for male; in faculty ranged from 36.95% for Business Administration, 32.60% for Engineering and 30.43% for Information Technology.

Phase 2: The results of six TNI core values "KM-HR-HoP" of Thai-Nichi Institute of Technology students

Table 2: Table of mean and standard deviation of using six TNI core values "KM-HR-HoP" of Thai-Nichi Institute of Technology students in each aspect and in total

Components	**N**	$\bar{X}$	**S.D.**	**Level**
1. Kaizen	322	4.44	0.71	high
2. Monodzukuri	322	4.31	0.69	high
3. Hansei	322	4.39	0.73	high
4. Respect	322	4.25	0.75	high
5. Honest	322	3.99	0.89	high
6.Public Interest	322	3.34	0.92	moderate
Total	**322**	**4.12**	**0.78**	**High**

The table above indicated that TNI students had using TNI core values "KM-HR-HoP" at high level ($\bar{X}$= 4.12) when considered in each aspect. It was found that *Kaizen*($\bar{X}$= 4.44), *Monodzukuri*($\bar{X}$= 4.31), *Hansei*($\bar{X}$= 4.39), *Respect*($\bar{X}$= 4.25), *and Honest*($\bar{X}$= 3.99) *were* at high level. For *Public Interest* ($\bar{X}$= 3.34), it was at moderate level.

Phase 3: The results of study opinions and suggestions about using six TNI core values "KM-HR-HoP" of Thai-Nichi Institute of Technology students

Table 11: Table of frequency and percentage of number of opinions and suggestions about using six TNI core values "KM-HR-HoP" of Thai-Nichi Institute of Technology students

Opinions and suggestions	**n**	**Fre.**	**%**
Using TNI core values "KM-HR-HoP"	**65**		
Opinions	**15**		**23.07**
1. Learning by using Monodzukuri is essential for students at TNI.		7	10.76
2. Respect is the good etiquette for Thai and Japanese culture.		4	6.15
3.Hansei is the best method for revision about students' false.		3	4.61
4. Being a student at TNI gains a lot of knowledge and various cultures.		1	1.53
Suggestions	**50**		**76.93**
1. The six essential TNI core values should be advised in the classroom.		18	27.69
2. Public interest should be promoted in Thai society to support students in considering the importance of public interest.		15	23.07
3. Honor should be applied in Thai culture to promote Thai characteristics.		10	15.38
4. Learning by practicing should be employed in higher education level more and more.		5	7.69
5. Kaizen should be trained with students from primary level to tertiary level.		2	3.07

The table showed that TNI students have opinions and suggestions in six TNI core values "KM-HR-HoP" of Thai-Nichi Institute of Technology students as following:

1. In using six TNI core values "KM-HR-HoP" of Thai-Nichi Institute of Technology students, it revealed that the answers of 65 students were divided into 2 categories which were opinions and suggestions; 15 students (23.07%) and 50 students (76.93%) respectively. *Learning by using Monodzukuri is essential for students at TNI* was equal to 10.76% (7 students); *Respect is the good etiquette for Thai and Japanese culture* 6.15% (4 students); *Hansei is the best method for revision about students' false* 4.61% (3 students); *Being a student at TNI gains a lot of knowledge and various cultures* 1.53% (1 students).

Suggestions from 50 students (76.93%) were, *The six essential TNI core values should be advised in the classroom* 27.69% (18 students); *public interest should be promoted in Thai society to support students in considering the importance of public interest* 23.07% (15 students); *Honor should be applied in Thai culture to promote Thai characteristics* 15.38% (10 students); *Learning by practicing should be employed in higher education level more and more* 7.69% (5 students); *Kaizen should be trained with students from primary level to tertiary level* 3.07% (2 students).

Conclusion

According to the study and data analysis, the result of this study was concluded as follows.

Phase 1: The results of demographic variables of TNI undergraduate students.

The percentages of the TNI undergraduate respondents in gender ranged from 53.73 % for female and 46.27% for male; in faculty ranged from 36.95% for Business Administration, 32.60% for Engineering and 30.43% for Information Technology

Phase 2: The results of using six TNI core values "KM-HR-HoP" of Thai-Nichi Institute of Technology students

TNI students used TNI core values "KM-HR-HoP" at high level ($\bar{X}$= 4.12) when considered in each aspect. It was found that *Kaizen*($\bar{X}$= 4.44), *Monodzukuri*($\bar{X}$= 4.31), *Hansei*($\bar{X}$= 4.39), *Respect*($\bar{X}$= 4.25), *and Honest*($\bar{X}$= 3.99) *were* at high level. For *Public Interest* ($\bar{X}$= 3.34), it was at moderate level.

Phase 3: The results of study opinions and suggestions about using six TNI core values "KM-HR-HoP" of Thai-Nichi Institute of Technology students

TNI students have opinions and suggestions in six TNI core values "KM-HR-HoP" of Thai-Nichi Institute of Technology students as following:

In using six TNI core values "KM-HR-HoP" of Thai-Nichi Institute of Technology students, it revealed that the answers of 65 students were divided into 2 categories which were opinions and suggestions; 15 students (23.07%) and 50 students (76.93%) respectively. *Learning by using Monodzukuri is essential for students at TNI* was equal to 10.76% (7 students); *Respect is the good etiquette for Thai and Japanese culture* 6.15% (4 students); *Hansei is the best method for revision about students' false* 4.61% (3 students); *Being a student at TNI gains a lot of knowledge and various cultures* 1.53% (1 students).

Suggestions from 50 students (76.93%) were, *The six essential TNI core values should be advised in the classroom* 27.69% (18 students); *public interest should be promoted in Thai society to support students in considering the importance of public interest* 23.07% (15 students); *Honor should be applied in Thai culture to promote Thai characteristics* 15.38% (10 students); *Learning by practicing should be employed in higher education level*

more and more 7.69% (5 students); *Kaizen should be trained with students from primary level to tertiary level* 3.07% (2 students).

Discussion

According to the study and data analysis, the results of this study could be discussed as follows.

The result of using six TNI core values "KM-HR-HoP" of Thai-Nichi Institute of Technology students was at high level. In this way, it might because TNI students used TNI core values "KM-HR-HoP" in order to the policy of the TNI president who campaigned about the six TNI core values from the beginning of being first year students at TNI. According to Bandhit Rojarayanont (2016), who advocated that the TNI students should follow these principles: KAIZEN (Continuous improvement); MONOZUKURI (Being able to think and do by oneself); HANSEI (Self-Reflection means considering and improving oneself first); Respect (Honor yourself and others); Honest (Sincere, not corrupt, not take advantage of others); and Public-interest conscious (Awareness to public interest).

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Effects of English Speaking Ability by Using Monodzukuri Approach of Business Japanese Students

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Abstract

The purposes of this research were 1) to study effects of English speaking ability by using Monodsukuri Approach of Business Japanese students at Thai-Nichi Institute of Technology, 2) to compare English speaking ability of experiment group and control group, and 3) to study Business Japanese students' satisfaction with this type of Monodzukuri approach.

The subject consisted of 35 first year Business Japanese students at Thai-Nichi Institute of Technology during first semester of 2017 academic year. The instruments used in this experiment included lesson plans, an evaluation form, an English speaking test and a satisfaction questionnaire.

The experimental process and data collection were conducted as follows: The subjects were given an English speaking ability pretest. Then, the 6 English speaking topics were used 24 hours in 8 weeks. After the completion of each topic, a project evaluation form and a student's self-assessment form were administered to measure the subjects' English speaking achievement, and a questionnaire was used for surveying the subjects' satisfaction on Monodzukuri approach.

The t-test was employed to compare the subjects' English speaking achievement before and after using Monodzukuri approach. The mean and standard deviation of scores from the topic evaluation form, the student's self-assessment form, and satisfaction questionnaire were used to measure at the end of the first topic to sixth topic. The experiment lasted twenty-four hours.

The results were as follows; 1) The Business Japanese students' speaking achievement after Monodzukuri approach was statistically significantly higher than before at 0.01 level, 2) The speaking ability of experiment group was statistically significantly higher than control group at 0.01 level, and 3) The students' satisfaction towards studying Monodzukuri approach to enhance English speaking ability of TNI students after the six topics was at the highest level.

Keywords: *English Speaking Ability, Monodzukuri Approach*

Introduction

Monodzukuri approach is a Japanese product culture that creates quality products and services using skills and technology. It is significant to produce high quality products which use both language skills and technology in order to meet the needs of customers, create all the processes from the beginning to the end, and continuously improve production (Kaizen).

In Monodzukuri approach, teaching and learning will be taught to create people who have Hitosukuri souls based on the following principles: 1) create high quality graduates; 2) have both the knowledge and technology skills; 3) meet the needs of enterprises; 4) can learn by themselves; 5) have the passion and dedication to create the best work; and 6) continuously improve instruction on human formation. Moreover, Thai-Nichi Institute of Technology has adopted Monodzukuri to apply with teaching and learning. The main concept

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focuses on "Acting" which faculty or college will require students to produce their own work (Rojarayanont, 2016).

In addition, Monodzukuri approach is applied in teaching and learning management in different teaching styles which will be developed to suit the context and goals of the course. The instructor will develop regular teaching and learning styles to be effective in learning as follows:

1. To improve the communication skills by focusing on theoretical and practical issues. This includes employing team teaching technique between Thai and foreign teachers.
2. To provide students' opportunity to communicate with native speakers in all subjects. This should be done in every class.
3. To support students in continuously training through a chat room with foreign teachers. Moreover, a project to develop skills in communication with foreigners outside the classroom is assigned in every subject (Thai-Nichi Institute of Technology, 2014).

Besides, the learner can hardly understand anything at all, unless the language being learned is closely related to some other language the learner knows. The learners can perceive some vocabulary and some grammatical structures through comprehension activities, which will assist the learners to realize more in conversation in a simple way. In real communication situations the learners have to depend on memorized survival phrases to meet the most immediate needs. The language students are considered successful language learner, if they can speak foreign language. Furthermore, Richards (2008) advocated that the speaking skill as a significant skill of language learning. Speaking English is a useful tool to transfer feeling. It is a process of massage and of information that lead to produce utterances orally to meet special purposes.

In this study the researcher needs to study effects of English speaking ability by using Monodzukuri approach of Business Japanese students at Thai-Nichi Institute of Technology. The results of this research will be used for improving instruction and developing teaching materials in English classes to be highly efficient.

Research purposes

1) To study effects of English speaking ability by using Monodsukuri Approach of Business Japanese students at Thai-Nichi Institute of Technology

2) To compare English speaking ability of experiment group and control group

3) To study Business Japanese students' satisfaction with this type of Monodzukuri approach

Methodology

Population and Samples

This research was to study effects of English speaking ability by using Monodsukuri Approach of Business Japanese students at Thai-Nichi Institute of Technology which consisted of population and samples as follows:

Population of this research was 900 Business Japanese students in 2016 academic year. Samples of the research were 35 Business Japanese students derived through simple random sampling technique.

Duration in Experiment
The experiment ran for 8 weeks (24 hours)

Contents used in this experiment

Contents used in this experiment consisted of 6 topics which derived through students needs as follows:

1. Friends are important for everyone - What do think about it??
2. Who do you take with you when you go shopping?
3. What would you show a guest in your hometown?
4. What is your bad experience? Why?
5. What will be the most important things for you in the future?
6. What is your dream job?

Variables
Variables in this study were as follows:

1. The English speaking ability of Business Japanese students.
2. The satisfaction of Business Japanese students towards English speaking course.

Research Instruments

1. The pre-post English speaking test
2. The six speaking lesson plans
3. The English speaking ability evaluation form
4. The satisfaction questionnaire

Data Analysis

The collected data was analyzed using computer program. The t-test was employed to compare the subjects' English speaking achievement before and after English speaking course. The mean and standard deviations of scores from English speaking evaluation form, the satisfaction questionnaire were used to measure at the end of the course.

Data Collection

The experimental process and data collection were conducted as follows: The subjects were given an English speaking ability pretest. Then, the six lesson plans were used in first semester. After the completion of each lesson, the English speaking ability evaluation form, and the satisfaction questionnaire were used for surveying the subjects' satisfaction with speaking method. The data were statistically analyzed by mean scores, standard deviation, percentage and t-test for dependent samples.

Research Results

1. Results of English speaking ability analyzing of Business Japanese students **which derived through speaking assessment in each learning plan in 6 times**

Table 1: Mean scores of English speaking ability of TNI Students from 1st-6th time

No.	1 (10 scores)	2 (10 scores)	3 (10 scores)	4 (10 scores)	5 (10 scores)	6 (10 scores)	**total (60 scores)**	%
1	8	9	9	9	8	7	50	83.33
2	9	8	8	8	8	8	49	81.66
3	9	9	9	8	8	8	51	85.00
4	9	9	9	10	9	9	55	91.66
5	8	8	8	9	8	7	48	80.00
6	8	8	8	8	8	8	48	80.00
7	8	9	9	8	8	8	50	83.33
8	8	8	7	10	9	9	51	85.00
9	8	8	8	9	8	7	48	80.00
10	9	8	8	8	8	8	49	81.66
11	9	9	9	8	8	8	51	85.00
12	9	9	9	10	9	9	55	91.66
13	8	9	9	9	8	9	52	86.66
14	9	8	8	8	8	8	49	81.66
15	9	9	9	8	8	8	51	85.00
16	9	9	9	8	9	9	53	88.33
17	8	9	9	8	8	7	49	81.66
18	9	8	8	8	8	8	49	81.66
19	9	9	9	8	8	8	51	85.00
20	9	9	9	8	9	9	53	88.33
21	8	9	9	9	8	10	53	88.33
22	9	8	8	8	8	8	49	81.66
23	9	9	9	8	10	8	53	88.33
24	9	9	9	8	9	10	54	90.00
25	8	9	9	9	8	7	50	83.33
26	8	8	8	8	8	8	48	80.00
27	8	8	8	8	8	8	48	80.00
28	8	9	9	8	9	9	52	86.66
29	8	8	7	9	8	7	47	78.33
30	8	8	8	8	8	8	48	80.00
31	8	8	8	8	8	8	48	80.00
32	8	9	9	10	9	9	54	90.00
33	9	8	10	9	8	7	51	85.00
34	8	8	8	8	8	8	48	80.00
35	9	9	9	8	8	8	51	85.00
Mean	8.48	8.54	8.54	8.45	8.28	8.14	**1,766**	**84.09**
%	84.80	85.40	85.40	84.50	82.80	81.40		

The assessment of English speaking ability of Business Japanese students, the researcher used English speaking test in each unit which assessed continuously every unit of learning. Therefore, percentage of scores was calculated from criteria as following; (adapted from Thaweerat, 2000; Wongsothorn, 1995)

81-100 means very high
61-80 means high
41-60 means moderate
21-40 means low
1-20 means very low

The table showed that the unit test scores of Business Japanese students in the total were at 1,766 out of 2,100 scores which calculated to be percentage at 84.09% out of 100%. This meant that business and technical students had English speaking ability at very high level. However, when considered in each unit, it was found that Business Japanese students got the highest scores from unit 2 (85.40%) and unit 3 (85.40%) respectively.

2. Results of analyze pretest and posttest scores of English speaking ability test of Business Japanese students

The researcher used English speaking ability test (1 item: 50 scores) to experiment students' ability both pretest and posttest after learning. Then pretest and posttest scores were compared as following table:

Table 2: Comparison of pretest and posttest mean scores in English speaking ability of Business Japanese students

English speaking ability scores	n	$\bar{x}$	S.D.	t	Sig.
Pretest	35	21.07	3.47	49.714	
Posttest	35	43.69	1.96	83.563	0.000**

** *Statistically significant differences at .01 level*

The table showed that English speaking ability of Business Japanese students after the class was higher than before at .01 level. The mean scores of pretest were at 21.07 and mean scores of posttest were at 43.69. It demonstrated that effects of English speaking ability by using Monodsukuri Approach was able to enhance students' speaking ability.

Table 3: Comparison of pretest and posttest mean scores in English speaking ability of Experiment Group and Control Group

English speaking ability	n	$\bar{x}$	S.D.	t	Sig.
Experiment Group	35	43.69	1.96	83.563	
Control Group	35	28.13	3.17	46.384	0.000**

** *Statistically significant differences at .01 level*

The table showed that English speaking ability of Experiment Group was higher than Control Group at .01 level. The mean scores of Control Group was at 28.13 and mean scores of Experiment Group was at 43.69. It demonstrated that effects of English speaking ability by using Monodsukuri Approach of Business Japanese students was able to enhance students' speaking ability.

3. Result of satisfaction with English speaking ability by using Monodsukuri Approach of Business Japanese students after the course

Table 7: result of satisfaction of business and technical students after the course

Aspects	**Level of satisfaction**		**meaning**
	$\bar{x}$	S.D.	
1. Contents	4.33	0.65	high
2. Teaching and Learning Activities	4.53	0.79	highest
3. Teaching Design	4.51	0.72	highest
4. Instructors	4.73	0.69	highest
Total	**4.52**	**0.71**	**highest**

The table showed that mean scores of satisfaction towards speaking ability by using Monodsukuri Approach of Business Japanese students in overall were at the highest level ($\bar{x}$ =4.52), when considered in each aspect , it was found that the highest rank of satisfaction was Instructors ($\bar{x}$ =4.73), Teaching and Learning Activities ($\bar{x}$ =4.53), Teaching Design ($\bar{x}$ =4.51) and contents ($\bar{x}$ =4.33) respectively.

Conclusion

1. Business and technical students had English speaking ability at very high level.
2. The students' English achievement after learning was significantly higher than before, with instruction constructed at 0.01 level.
3. The speaking ability of experiment group was statistically significantly higher than control group at 0.01 level,
4. The students' satisfaction towards studying Monodzukuri approach to enhance English speaking ability of TNI students after the six topics was at the highest level.

Discussion

1. According to results of speaking ability by using Monodsukuri Approach of Business Japanese students was at a very high level. It might be because the students emphasized learning speaking by doing and had awareness about an important component of language speaking strategy training. Moreover, oral strategies are referred to in communicative strategies, conversation skills or oral communication strategies. This is related to O'Malley and Chamot (1990) who advocated that speaking strategies are crucial because they help foreign language learners in negotiating meaning where either linguistic structures or sociolinguistic rules are not shared between a second language learner and a speaker of the target language.

2. The students' speaking achievement after the course was significantly higher than before, with instruction constructed at 0.01 level. This might be because the samples understood how to make use of speaking strategies such as verbal and non-verbal strategies in communication which related to the idea of Hedge (2000) who stated that a competent speaker knows how to make use of speaking strategies. These strategies come into play when

learners are unable to express what they want to say because they lack the resources to do so successfully. Furthermore, verbal and non-verbal strategies such as; verbal circumlocution, clarification, non-verbal mimicry and gestures may be applied to compensate for a breakdown in communication or for unknown words or topics, and they may also be used to enhance effective communication.

3. The students had a very high level of satisfaction towards studying Monodzukuri approach. This might be because the students satisfied with learning by practicing which focused on English speaking activities, proficiency and communication in real life. This is related to the concept of Canale (1983) who encouraged training in speaking strategies because learners must be trained in speaking the second language. Furthermore, learners must be encouraged to use such strategies and must be given the opportunity to practice in real world.

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Exploring Teachers' Listening in Classroom Using Lesson Study and Open Approach

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Abstract

This research aims to explore teachers' listening method in classroom using lesson study and open approach. This research is the qualitative with Protocol Analysis and Analysis Description methods. The target samples are 2 teachers who have 8 and 3 years of open approach teaching experience. Class data collection was conducted through lesson study and open approach methods according to Inprasitha (2011) and analyzed through the listening framework of Davis (1997). The result found that, there are 4 teachers' listening formats in classroom using lesson study and open approach as follows; First step: open-ended problems posing; includes interpretive and hermeneutic listening formats without evaluative listening format from both target samples, Second step: students' self-learning; includes interpretive and hermeneutic listening formats without evaluative listening format from both target samples, Third step: Whole class discussion and comparison found that, first target sample, a teacher who has 8 years open approach teaching experience, applies interpretive and hermeneutic listening formats without evaluative listening while the second target sample, a teacher who has 3 years of open approach teaching experience, applies evaluative, interpretive and hermeneutic listening formats. We found evaluative listening format only in the first teaching lesson plan and Fourth step: Summarization through connection students' mathematical ideas emerged in the classroom; includes interpretive and hermeneutic listening formats without evaluative listening format from both target samples.

Keywords: *Teacher listening, Lesson study, Open approach*

Problems background and significance

Effective teaching involves observing students, listening carefully to their ideas and explanations, having mathematics goals, and using the information to make instructional (NCTM, 2000). Listening to the students is the most important for an effective teaching (Davis, 1997; Hintz and Tyson, 2015). After considered on listening aspect during the lesson study class in Thailand found that, the current Thai teaching still focuses and emphasizes on the learning achievement rather than the learning process and the most activities are considered as the teachers' methods like; narration, explanation, answering or media demonstration (Inprasitha, 2003). The teaching style focuses on knowledge distribution rather than students listening thus, teachers could not observe students' concepts during any conversation and could not interpret any students' speaking and doing (Davis, 1994). These problems solving could be done to change the teachers' activity providing style through students' self-mathematical concepts and solving behavior support (Steen, 1990, cited on Inprasitha, 2014). Therefore, Inprasitha, 2003, applied the Lesson Study method to adapt teachers' coordinated working with an Open-Approach mathematical teaching which focuses on problems solving as the students'

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concepts listening method and this method depends on students' activities and learning. The important factor of any listening methods is an important terms using that was referenced to listen students' speech during their activities and teachers have to spare their time to listen the students' concepts (Inprasitha, 2014, cited on Wetbanphot, 2015). Davis (1997) provided 3 classroom listening methods: 1) Evaluative Listening, 2) Interpretive Listening and 3) Hermeneutic Listening. An intention about the listening method using from teachers would comprehend them the better teaching. As mentioned above, the researcher recognized about students' concepts listening within Lesson Study and Open-Approach class. Thus, the researcher was interested to do the teachers' listening in classroom using Lesson Study and Open-Approach research.

Research Purpose

This research aims to explore the teachers' listening in classroom using Lesson Study and Open-Approach.

Terminology

1) Teacher listening is the teacher expression that shows about students' concepts recognition and appreciation through listening process. It is a behavior that expressed by observation, speaking and gesticulation. These behaviors are prepared to provide the learning management plan in order to assign the teachers' roles within an Open-Approach classroom (Inprasitha, 2014) and teachers' listening in students' concepts by an Open-Approach of this research according to 3 teachers' listenjing methods: Evaluative Listening, Interpretive Listening and Hermeneutic Listening.

2) Evaluative Listening is the teacher expression that shows about students' concepts correction through their ideas when the students' concepts do not relate to the teachers. Teachers will gesture, speak or set up the students' concepts argument or fill up the correct answers as well as persuade students to show the appropriate concepts.

3) Interpretive Listening is the teacher expression that shows about students' conversation and detailed debate or explanation or narration and concepts explanation writings without correctable focusing opportunities.

4) Hermeneutic Listening is the teacher expression that shows students' activation to discuss their concepts through conversation and detailed debate or explanation or narration and concepts explanation writings in terms of conjunctive concepts searching and resolve or change.

5) Classroom Using Lesson Study and Open-Approach is the integrated study classroom with Lesson study and Open-approach methods where carried out by teacher and researcher team to provide students' self-learning classroom through Lesson study and Open-approach methods according to Inprasitha (2014) idea.

6) Lesson Study is the coordinated teaching plan providing processes of researcher, teacher and researcher team to adapt the Lesson Study and Open-Approach and reflect the post teaching results according to the Lesson Study idea of Inprasitha (2014) which includes with 3 following steps:

1) Collaboratively design a research lesson study, observation teacher and researcher team to adapt the problem situations with various concepts to the classrooms, give students the mathematical concepts thinking opportunities through their self-mathematical problems solving and predict the further classroom concepts in order to be the students' concept listening guidelines.

2) Collaboratively observe the research lesson, observation teacher and researcher team to observe the classroom and teacher-students interaction. The teacher's listening was expressed through students' concepts observation, explanation and feedback.

3) Collaboratively discuss and reflect on the research lesson, the coordinated post teaching results discussion and classroom observation in order to be further improved.

7) Open Approach is the teaching method that focuses on students' self-problems solving from the open-ended situations. This method gives teachers the students' concepts listening opportunity according to an Open-Approach idea of Inprasitha (2014) that includes following 4 steps:

1) Posing open-ended problem is the problem situations narration or open-ended problem situation explanation from teacher.

2) Students' self-learning is the process that student solve any problems by themselves before problem situations providing from the teachers or self-problems solving and then students will solve any problems through the symbolic writings or group work conversation.

3) Whole class discussion and comparison is the students or group work presentation before the classroom in forms of writing or speaking discussion.

4) Summarization through connection students' mathematical ideas emerged in the classroom is the students' results summarization from the students' concepts collection through classroom board presentation in order to let students affirm their works and summarize the lesson results for the further lesson learning.

Research Methodology

1) Classroom context for this research

This research depends on the Students' Mathematical Higher Thinking Development Project in Northeastern of Thailand which is the teaching innovation from Center for Research in Mathematics Education (CRME), Khon Kean University .The data was collected from Chum Chon Bankaengkronongpai School.This school has attended the Students' Mathematical Higher Thinking Development Project in Northeastern of Thailand, the Center for Research in Mathematics Education (CRME), Khon Kean University since 2009. and Bansomkob (Ratradbamrung) School that attended the students' advance mathematical thinking project in the area of northeastern under the control and advice of the experts from Center for Research in Mathematics Education, Faculty of Education, Khon Kaen University since 2014.

2) Target group

The target group of this research is 2 mathematics teachers for grade 1 students. The group had collected the data during the first semester, 2016 academic year. The target group includes: 1 Chum Chon Bankaengkronongpai School's teacher who has 8 years of Lesson Study and Open Approach teaching experience and also the data collection person and the second is the teacher from Bansomkob (Rathadbamrung) School, who has 3 years of Lesson Study and Open Approach teaching experience and also the data collection person as well.

3) Research tools

1) The data collection tools are lesson plan, fieldwork recording forms, activity worksheets, sound recorder(s) and video and slide recorder(s).

2) The data analysis tools are Teacher's listening idea from Davis (1997), video and slide recorder(s) protocols, interviewing protocol and students' works.

4) Data collection

The researcher and classroom study team studied the general context of Chum Chon Bankaengkronongpai School and Bansomkob (Rathadbamrung) School through students' learning behavior while the target group educated through the teachers' teaching and listening behaviors observation. Students were practiced to be similar with problems solving during the data collection process by the researcher and classroom study team. The assistant researcher recorded videos and slides while the researcher and other assistant researcher observed the teachers' listening, class teaching, students' concepts observation, student's discussion providing and students' learning recording behaviors. During the teaching procedure by the researcher and assistant researchers they would not intervene in the students' concepts.

Results

After analyzed the data from an Open-Approach idea of Inprasitha (2011) and considered the teachers' listening type according to the Davis (1997) idea, we can summarize the teachers' listening type with an Open-Approach procedure as the following tables:

Table 1: first target teacher's listening type summarization

Lesson Plan	4 steps of Open Approach	Evaluative listening	Interpretive listening	Hermeneutic listening
1	1. Posing open-ended problem	-	✓	✓
	2. Students' self-learning	-	✓	✓
	3. Whole class discussion and comparison	-	✓	✓
	4. Summarization through connection students' mathematical ideas emerged in the classroom	-	✓	✓
2	1. Posing open-ended problem	-	✓	✓
	2. Students' self-learning	-	✓	✓
	3. Whole class discussion and comparison	-	✓	✓
	4. Summarization through connection students' mathematical ideas emerged in the classroom	-	✓	✓
3	1. Posing open-ended problem	-	✓	✓
	2. Students' self-learning	-	✓	✓
	3. Whole class discussion and comparison	-	✓	✓
	4. Summarization through connection students' mathematical ideas emerged in the classroom	-	✓	✓

Table 2: second target teacher's listening type summarization

Lesson Plan	4 steps of Open Approach	Evaluative listening	Interpretive listening	Hermeneutic listening
1	1. Posing open-ended problem	-	✓	✓
	2. Students' self-learning	-	✓	✓
	3. Whole class discussion and comparison	✓	✓	✓
	4. Summarization through connection students' mathematical ideas emerged in the classroom	-	✓	✓
2	1. Posing open-ended problem	-	✓	✓
	2. Students' self-learning	-	✓	✓
	3. Whole class discussion and comparison	-	✓	✓
	4. Summarization through connection students' mathematical ideas emerged in the classroom	-	✓	✓
3	1. Posing open-ended problem	-	✓	✓
	2. Students' self-learning	-	✓	✓
	3. Whole class discussion and comparison	-	✓	✓
	4. Summarization through connection students' mathematical ideas emerged in the classroom	-	✓	✓

Table 1: the first target teacher who was teaching in Lesson Study and Open-Approach classrooms had two listening methods: 1) Interpretive Listening is the teachers' listening behavior through speaking, gesture and observation which were done to understand students' concepts and give students the opinion expression, narration, explanation writing without correctable intention opportunities as the aspects of students' concepts explanation and observation. 2) Hermeneutic Listening is the teacher's listening behavior through speaking, gesture and observation that were done to join the students' concepts from interlocution, discovered mathematical concepts discussion and conjointly improve the concepts. Teacher applied the students' iterative concepts listening post questions to observe the discovered matters and activate with concepts discussion questions in order to summarize the classroom context. The non-emerged listening method is Evaluative Listening since the teacher did not listen to the students' speaking, gesture and observation, the factors of students' concepts correction or the answers filling. However, the teacher accepted and recognized students'

concepts through the opinion expression and discussion so there are 2 listening methods, Interpretive and Hermeneutic Listening.

Table 2: the second target teacher who was teaching in Lesson Study and Open-Approach classrooms had three listening methods: 1) Evaluative Listening is the persuasive and answers filling behaviors of teacher to have the required answers. In term of 3 teacher's listening methods found that, there was only 1 listening method within the third step of learning management plan, Interpretive Listening, teacher's listening through speaking, gesture, observation to understand the students' concepts and give students opinion expression, narration and explanation writings opportunities without any correctable intention. These are the aspects of teacher's concepts explanation and observation. 3) Hermeneutic Listening is the teacher's listening through speaking, gesture and observation to join the students' concepts from interlocution, discovered mathematical concepts thinking discussion and coordinated concepts improving as well as discussion questions using for activation to summarize the classroom context.

Conclusion and Discussion

1) Conclusion

After explored the teacher's listening in classroom using Lesson Study and Open Approach of 2 target teachers who were teaching for grade 1 students and found that, first target teacher has two listening methods according to Davis (1997) and the second target teacher has all three listening methods according to Davis (1997) within 4 steps of an Open-Approach as follows:

First Step: Posing Open-Ended Problem

This step posts the open-ended problem and found 2 listening methods: Interpretive and Hermeneutic Listening without Evaluative Listening within the Lesson Study and Open-Approach classrooms from these 2 target teacher. In addition, there is Interpretive Listening occurred in every learning management plans of the target group in the aspects of students' concepts listening and observation to understand these concepts by students' opinion expression.

Second Step: Students' Self-Learning

There are 2 listening methods, Interpretive and Hermeneutic Listening without Evaluative Listening within the Lesson Study and Open-Approach classrooms from these 2 target teacher. The Interpretive Listening was occurred during the students' problem solving concepts process through the observation, questions activation, explanation persuade and opinion expression opportunities as well as the Hermeneutic Listening during the students' concepts observation to join as the aspects of interlocution and discussion through summarization. We also found about teacher's standing concepts observation for classroom context recording.

Third Step: Whole class discussion and comparison

This step found that, the first target teacher who has 8 years of Open-Approach teaching experience applied the Interpretive and Hermeneutic Listening without Evaluative Listening and the second target teacher who has 3 years of Open-Approach teaching experience applied the Interpretive, Hermeneutic Listening and Evaluative Listening. The Evaluative Listening was found only in the first learning management plan. In the step of whole class discussion and comparison found the Interpretive and Hermeneutic Listening in every lesson plan of 2 target teachers. The Interpretive Listening was found in the aspects of students' concepts explanation and comprehension and Hermeneutic Listening was found in the aspect of open-ended problem posing and students' self-learning processes to conduct in mathematical discussion and checking for summarization.

Fourth Step: Summarization through connection students' mathematical ideas emerged in the classroom

This step found that, the first target teacher applied the Interpretive and Hermeneutic Listening without Evaluative Listening and the second target teacher applied the Interpretive and Hermeneutic Listening without Evaluative Listening too. The listening method which could be found in every target teachers' learning management plans is the Interpretive Listening as the aspects of students' concepts explanation and the group work results summarization.

2) Discussion

In term of discussion found that, the teacher who has 8 years of Open-Approach teaching experience did not apply an Evaluative Listening and the teacher who has 3 years of Open-Approach teaching only applied an Evaluation Listening only in the leaning management plan it means that the longer experienced teacher did not evaluate the students' concepts into correctable matters but do giving students' concepts explanation instead while the shorter experience teacher might apply Evaluative Listening in some learning management plans but the listening method that can be found in every learning management plans and all of 4 Open-Approach teaching processes is Interpretive Listening it means the teachers educate in the basis of interpretation. Therefore, the students' concepts opinion expression and explanation are not limited if they are correct or not and the Hermeneutic Listening will be found in whole class discussion and comparison of every learning management plans. In order that, teacher who applied the Lesson Study and Open-Approach would observe the students' concepts in self-study step and this data would be managed within the process of whole class discussion and comparison through whole class discussion and summarization process.

After considered the listening aspects within Thai learning class found that, the current Thai education still focuses and emphasizes in the study achievement rather than learning procedures focusing. Most activities are regards as teachers like; narration, explanation, answering or media demonstration (Inprasitha, 2003) that related with Kaeodaeng, 1997, that informed about current Thai learning teacher is the knowledge seeker who instill the students to let them memorize without thinking, analysis or self-searching education. Thus, Thai people deficient in self-searching skill. The teaching method which focuses on the knowledge distribution rather than listen to the students would cause the teachers had no chance to observe students' concepts from conversation and students' speaking and doing interpretation (Davis, 1994). The result found that, the Lesson Study and Open-Approach according to the idea of Inprasitha, 2011; 2014, the pioneer of this innovation and made mathematics teachers have their teaching methods through students' concepts listening with recognition and valuate the classroom concepts according to an Open-Approach idea of Intraprasitha, 2014, informed that an Open-Approach that applied as teaching guideline so teachers have to change their roles. The second step of Open-Approach teaching, teachers have to change their roles from narrators or informants to the observers who play the role of students' concepts recording while students' self-problems solving process.

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The Study of Process and Speaking Skill Implementing Constructivism in Supplementary English Course for Grade 8 Students of Khon Kaen Demonstration School (Modindang)

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Abstract

The research aimed to study the process of constructivism model in Supplementary English course for grade 8 students, and study the students' speaking skill achievement using constructivism model. The passing criterion was 70 percent. The target group was a total of 34 students in class 2/1 who were studying in semester 2 of academic year 2016 of Khon Kaen Demonstration School (Modindang). Research instruments were: 20 lesson plans in Supplementary English course which covered 25 periods. They were used as the learning management tool. 2) Speaking skill evaluation form was used as the data collecting tool in order to study students' speaking skill. The research was a pre-experimental design. Data was collected from speaking skill evaluation form and analyzed by mean ($\bar{x}$) and the percentage.

There were 5 steps of constructivism model as follows Orientation, Elicitation of the prior knowledge, Turning restructuring of ideas, Application of ideas and Review. The researchers found that the students' average score was 25.47 in other words, there was 84.9 percent respectively which was higher than the set criterion. The number of students who passed the average scores was 25 students or 73.52 percent which was also higher than the set criterion.

Keywords: *Constructivism model, speaking skill achievement*

Introduction

Education is an important tool in creating and nurturing human resources to develop a progressive and sustainable society. Learning process management is important. National of Education Act B.E. 2542, and amendments: second National Education Act B.E. 2545 Chapter 4 Education Management Guidelines Section 24 Learning Management focuses on content and activities that are in accordance with the interest and aptitude of learners, promote skill training, thinking process, management, situation control and applying knowledge to prevent and solve problems, hold activities for learners to learn from real experiences, train in practice to be able to know how to think and do, loves to read and have continuous interest in learning (Ministry of Education, 2003). In the current society, learning a foreign language is important and necessary in daily life since it is an important tool in communication, education, knowledge search, occupation, creating understanding culture and vision of the world community. The Ministry of Education declared announced the Basic Education Core Curriculum B.E. 2551 (A.D. 2008) for the Foreign Languages Department from primary school to high school so that learners can train various aspects of language skills especially speaking skills. The Department of Curriculum and Instruction Development (2002) concluded the key points of speaking skills as the ability to speak foreign languages is necessary in displaying the needs and feelings of the speaker. It can be used in situations

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related to daily life as well as able to express opinions deftly. If one can speak, then they can also understand things other people say and helps with reading and writing. However the aforementioned teaching method meets to research on concept, theory, principle and guidance in teaching model to develop said characteristics especially in supplementary English courses which according to the education institution curriculum states that learners have no knowledge in addition from the basic core courses that stresses on learners being able to communicate and express opinions. Learners must receive an orientation eliciting prior knowledge to connect or use as a foundation for further studies. There is change in knowledge, leading to creating new knowledge and together assess new knowledge to apply the knowledge correctly and appropriately. Elicitation of prior knowledge and new knowledge that is in accordance with the constructivism model that is under the principle of learning process reform which focuses on learners. It is a learning that allows opportunities for learner to apply knowledge and skills in real life. That is, 1) in the orientation, it is a step in which learners will perceive the aim of the lesson and have motivation in learning. 2) Elicitation of the prior knowledge is a step in which learners display past knowledge and understanding in what they will be learning. 3) Turning restructuring of ideas is an important step in constructivism model which comprises of the following steps: clarification and exchange of ideas, a way to encourage learners to use thinking skills to create constructivism of new ideas from discussion and demonstration, allowing learners to set new ideas or new knowledge. There is evaluation of ideas by experimenting or thinking deeply. 4) Application of ideas is a step where learners are given opportunities to apply concepts or knowledge and understanding in development, allowing learners to have a meaningful learning. 5) Review is the last step. Learners will review their thoughts and understanding by comparing new and old thoughts (Sumalee Chaijaroen, 2008). The researchers are interested in studying the development of English speaking skills achievement using constructivism for grade 8 students to solve the issue of students' speaking skill to be more efficient. In addition, it is also in accordance with The Basic Education Core Curriculum B.E. 2551 (A.D. 2008) that aims to develop learners to accomplish the set standard which is the ability to communicate, receive and send media, transfer thoughts, knowledge, understanding, feelings and vision to exchange information and experience that will develop them self and society.

Research Objectives

1. To study the process of constructivism model in Supplementary English course for grade 8 students of Khon Kaen Demonstration School (Modindang)
2. To study the students' speaking skill achievement using constructivism model with a set criterion of 70 percent.

Definitions

1. Speaking skill means speaking score after learning has been completed.
2. The steps to the constructivism model is as follows;

2.1. Orientation is using diverse activities to encourage learners to become interested in the content

2.2. Elicitation of the prior knowledge: learners can connect knowledge or past experiences in learning the content

2.3. Turning restructuring of ideas: learn new vocabulary, additional language structure from prior knowledge or apply past experiences to expand their knowledge

2.4. Application of ideas is a step where learners are given opportunities to apply learnt concepts or knowledge to develop their writing skills, allowing learners to have a meaningful learning.

2.5. Review is the last step. Learners will review their ideas and understandings by comparing ideas between old and new ideas until they are able to narrate on environment, travel, and technology at the end of each learning unit by using the constructivism steps of Sumalee Chaijaroen, 2008.

Research Procedure

1. Scope of the Research

The target group was a total of 34 students in class 2/1 who were studying in semester 2 of academic year 2016 of Khon Kaen Demonstration School (Modindang) Independent variable was the constructivism model.

Dependent variables were

1. The process of constructivism model in Supplementary English course for grade 8 students of Khon Kaen Demonstration School (Modindang)
2. The students' speaking skill achievement using constructivism model. The passing criterion was 70 percent.

2. Research Instruments

2.1 Research instruments were 20 lesson plans in Supplementary English course which covered 25 periods. The researchers have studied theories, concepts, principles and related research to learning management according to constructivism model. In this research, the learning management has been centered on the Basic Education Core Curriculum B.E. 2551 (A.D. 2008). The researchers have analyzed content from the English Department curriculum secondary section of Khon Kaen Demonstration School (Modindang) by analyzing content from the vision map to create a teaching schedule that divides appropriate time between content and activities that is in accordance with learning objectives of grade 8 curriculum and guidelines in holding activities stressing actual practice for learners to receive direct experience and searching for knowledge by themselves. The course covered 25 periods and three learning units. Lesson plans were written according to the constructivism model. The lesson plans were examined by experts for suggestions on content relevant, learning management and evaluation. Three experts examined face validity of the Likert-type opinionnaire which is a rating scale with five levels (Samphan Phanpruk, 2007). The results of the evaluation were that the lesson plans are very suitable.

2.2 Speaking skill evaluation form was created in accordance to the behaviors which will be studied, comprising of 1) **Pronunciation/ Utterance** 2) **Vocabulary and Grammar Structures** 3) **Contents** 4) **Fluency and** 5) **Gestures.** Three experts examined face validity of the Likert-type opinionnaire which is a rating scale with five levels (Samphan Phanpruk, 2007). The results of the evaluation were that evaluation form is very suitable.

3. Research Design is pre-experimental designs

$$X \longrightarrow O$$

X means activities according to constructivism model
O means speaking skills scores after classes
(Chariya Sethaputra, 1983)

4. Research Method

4.1 Data Collection

Data was collected by holding activities in accordance with constructivism model for 20 lesson plans which covered 25 periods. At the end of the lessons, the learners were asked to speak about the content they had learnt for 3 units.

4.2 Data Analysis

Scores from the speaking after the lessons were analyzed by using mean ($\bar{x}$) and the percentage.

5. Research Results Conclusion and Discussion

The results of the five steps of constructivism model in pre-experimental designs are as follows;

1. Orientation especially speaking skills that are used to communicate with others. Right from the correctness of word pronunciation, students must correctly understand the pronunciation principle to be able to pronounce words similar to or the same as a native speaker. Students were able to learn about vocabulary in the learning unit environment. Group activities were used for students to find vocabulary from pictures such as deforestation, alternative energy, recycling. In the technology unit learners guessed the pictures of various communication tools. Each group had to answer quickly to get scores such as laptop, Bluetooth, web cam. Learners had said the names of transport vehicles by dividing them into types of Travel-Land, Travel-Sea and Travel- Air without repeating the same vehicle as their classmate.

2. Elicitation of the prior knowledge. Various forms of techniques and media that will bring past knowledge to connect with the prepared content were used. For example, learners had try to think of word groups that connects with environment such as Factory smoke, chemical waste, cars and rubbish cause pollution.

3. Turning restructuring of ideas. The teacher had the students;

3.1. Exchange and learn between students where they can work as a group, help each other search for names of important places in Khon Kaen province, Thailand and in the world. They had to identify the location as well. For example, King Cobra Village. It is in Namphong district Kjhao Yao National park. It is in Korat. Ha Long Bay. It is in Vietnam. Learners speak out the words that are technological devices used in daily life. For example, could you get the vacuum cleaner out and clean the living room? Put the roast into the oven and let it roast for 45 minutes.

3.2. Create new ideas. Learners were able to compare the pros and cons of using the internet appropriately. For example, Advantages of Internet: a source of education for students, it provides online shopping. Disadvantages of the internet: negative effects on family communication, internet addiction. Learners presented the use of various education technologies. Learners could explain the meaning of words related to environment correctly. Some topics were supplemented or fixed to be more suitable such as Global warming is the process that makes the Earth's surface get warmer. Organic food is food that doesn't use chemical fertilizers and pesticides for producing of food. Learners learnt how to correctly pronounce words, in addition to their old knowledge. The researchers fixed the pronunciation to the correct one, in accordance with Rungfah Kitiyanusan (2009), who researched on Promoting Self – directed Learning of Student Teachers: Reflection Through Action Research. The research results found that the self-study process of the students in the Faculty of Education, Burapha University had a learning model that consists of assigning a

learning objective, planning their work and problem-solving, exchanging and learning, self-evaluation, seeing the value and benefit of what was learnt and applying it in real life.

3.3. Reevaluate ideas. Learners can decide whether they agree or disagree on the topic of computer usage, such as computer technology makes finding information faster and easier. It is impossible to become addicted to the internet. Then each group works together and present whether they agree or disagree with the sentence assigned by the teacher "children should be given more freedom and decide what they do online" do you agree or disagree? Explain. Learners had explained in class. Each group had presented in class where their classmates also expressed their opinion.

4. Application of ideas. In the travel and vacation learning unit, learners presented the details of their own vacation by answering each question, leading to writing a narration and presenting in front of the class. Learners in each group help each other answer questions in the worksheet "talk about travelling" and recount the events to the classmates in suitable arrangement. Researchers fixed the structure and corrected the usage of words. Learners drew pictures of places that they were interested in, starting from Khon Kean Province, Thailand and places they were interested in overseas along with explanations. In the learning unit environment, learners choose one disaster and drew a picture to explain the topic. Learners were tested by having to recount and answer questions. Learners were able to name at least three things that were natural and manmade. In addition, learners could also identify the appropriate and inappropriate activities towards the environment, such as in the good activities: Using both side of paper, planting tree can increase oxygen. Using public cars can reduce burning fuel that make Co. Inappropriate activities human has done to the environment such as Using chemical fertilizers: it is one of the cause of soil pollution. Moreover, learners could also connect it to good activities done at home and school to help save environment. For example, turning off lights after use, riding the university's free shuttle bus to the university's food center instead of using a motorcycle. As well as Amorn Rueangphaisan, Prawit Erawan and Manoon Siwarom (2 010) who had researched on The Application of Learning Activities Based on Constructivism and Problem-Based Learning to Science Learning on the World and Its Changes Topic for Matthayomsuksa 2 Students. Research results found that students that were thought using constructivism model activities and problem-based learning, have the ability to solve scientific problems and have satisfaction towards learning science higher than those who learnt with the normal method (P <.008).

5. Review. Students in each group guess the activities pictures that promote a better environment, as well as help say vocabularies that are related to environment such as Tsunami, Earthquake, Hurricane, Ice-melting. Representatives from each group stand at the front of the classroom and say the names of transport vehicles without repeating each other. Learners all helped say out things that would be necessary for travel such as map, luggage, credit card. Learners played a word guessing game. The researchers would say sentences that connect to the words. It was found that most students were able to answer. For example, My……is almost empty. I only have a few eggs, some cheese and a bottle of beer in it. Throw your wet clothes into the …….. They should be ready in about 20 minutes. I bought ten pounds of salmon and put it all into the ……to keep until the party next week. In which learners answered correctly as refrigerators, dryer and freezer, in accordance with Kouicem Khadidja (2011). Khadidja had done a research to demonstrate that teaching in the classroom according to the guidelines of communication and interaction, will help develop learns' speaking skills as well as become a teaching method that promotes abilities in thinking out speaking structure. Normally in research education, it is held to study relations between the opportunities to express themselves in a classroom with management that

supports expression and developing English speaking skills, whether they affect each other in what aspect and how. The sample group was third year students at Constantine University. It had focused on developing speaking skills. Two survey forms were used to observe behavior. Data received from the students and assistant teacher on using colloquial language for data that displays interaction in the classroom can develop speaking skills. From the research, it shows clearly that communicating orally by creating an atmosphere that allows learners to interact with each other can develop speaking skills very well.

From the constructivism model that stresses on learners using knowledge and ideas both individually and in groups, review, connecting prior and new knowledge, leading towards students being able to speak and remember important points according to the learning units learnt, it was found that grade 8 students of Khon Kaen Demonstration School (Modindang) had a mean of 25.47 (84.9 percent), passing the criterion. The amount of students that passed the criterion was 25 students (73.52 percent). It is in accordance with Sumalee Chaijaroen (2008) who stated that 1) the knowledge of any person is considered an intellectual structure which that person had created from experience in solving situations of problems and was able to use it as a foundation or explain other situations 2) Learners are the creators of knowledge using various methods by using prior experience and intellectual structure, interest and motivation inside themselves as a starting point. It is the same as Nanta Supotchalermkwan (2012) who had researched on Developing English Speaking Skill by Using a Set of Pictures with Explanations Introducing Tourist Attractions in Chiang Mai Province of Vocational Certificate 2/7 Students and found that learners had a post-classes achievement increase in mean of 13.78 (68.90 percent). This is resulted from learners receiving knowledge from the set of pictures with explanations introducing tourist Attractions in Chiang Mai province where learners had researched information by themselves. This allows learners to be enthusiastic in learning, receive knowledge without limitations, and learn happily without stress. Learners will have the courage to ask fellow learners rather than teachers and from how 21 learners have passing scores (91.0 percent), it is a result from learners studying by themselves, searching for knowledge from various sources and good preparation. It is similar to Parichart Techa (2010) who had done research on Developing Second Grade Students' Speaking and Listening Skills through Role-Play. It was found that designing role play activities in a lesson plan and setting a situation to use language in daily life as a situation in the classroom, students were able to express themselves which allows them to think and do real practice. It gave students opportunities to ask questions, discuss and express their opinions. This leaded to students understanding what was being taught quicker and achieving a score of 86.95 and 86.65 for the grade 5 students' English listening and speaking skills, respectively, which are higher than the passing criterion.

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The Effects of Learning Management by Flipped Classroom with Google Apps for Education to Skill Development of Create Publications with Microsoft Publisher 2007 for Grade 9th Students at Demonstration School of Khon Kaen University in Secondary Education (Modindaeng)

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Abstract

The purposes of this study were as follows: 1)To examine skill development of create publications with Microsoft Publisher 2007 of grade 9th students after learning by flipped classroom with Google apps for education, and 2)To study student's opinions. The target group of this research is grade 9th students of Demonstration School Khon Kaen University (Modindaeng). The research design was that of Pre-experimental design by using one short case study. The tools used in this study include: 1)Four learning plans, 2)Learning Media by Google apps for education such as YouTube, Google Drive, and Gmail. The tool used for collect the data include: 1)Assessment papers containing 4 0 multiple choice questions, 2)Assessment papers of Practical skills, and 3)student opinions survey forms. The data were analyzed by basic statistics include the mean percentage and standard deviation and analyzed in terms of quantity by summarizing and interpreting .The results revealed that:

1) The skill development of create publications with Microsoft Publisher 2007 were found most learning achievement's students at a good level. (43.59%) The average score is 70.21 from a max score of 100 and standard deviation is 12.39.

2) The student's opinions towards the learning by flipped classroom with Google apps for education. They agreed on four aspects include: 1)Content, 2)Learning media, 3)Learning management and 4)Other comments were as follows: flipped classroom make it possible to study on their own, and make them to create publication practically.

Keywords: *flipped classroom, Google apps for education, Microsoft Publisher 2007.*

Paper Instruction

1.1 Background and Rationale

The progress of information technology in the present has caused changes in people's lifestyles, economy, society and culture. Information technology has become a part of our everyday lives since the moment we wake up to when we go to sleep. In each day we use various information technology, like what we have seen everywhere such as phones, televisions and computers (Rotsukhon Makaramani, 2014). These information technologies have facilitated our everyday lives and communication which has gotten rid of distance-related obstacles. The world today is a world with no borders. No matter where we are, communication is possible. Due to this, lifestyles change and the cultures of each race go on simply and quickly, no matter if it's a good or bad thing. It also leads to a society of data, news, and knowledge that experts, philosophers as well as the experienced can publicize data, news or knowledge quickly. People all around the world can then access those data, news or

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knowledge easily. Information technology also causes changes in the economy at a global level – from an industrial economy to a service economy that is driven by data, knowledge and innovation (Kay, 2010 cited in Khajornsak Buaraphan, 2012). It can be said that the world today is a world of data, news and knowledge society. Due to the results of the changes caused by the aforementioned information technology that made the Partnership for 21th Century Skills in the United States of America aware of these changes. Importance is given to developing 3 skills necessary for life in the 21st century which are 1) Life and work skills 2) Learning and innovation skills and 3) Information technology skills. With these three important skills, good students are the future of the country that will become the main force and power that will drive the country and the world forward.

For the importance of the integration of information technology to promote and develop the 3 aforementioned skills teachers should be aware and give importance to developing learners to be able to create and use information technology most efficiently in learning. It is in accordance to the Flipped Classroom concept that teaches using information technology (Pangleela Burapapichitpai, n.d.) and gives opportunities for learners to learn through activities. Learners can learn and study content by themselves no matter where they are, at whatever time. The time students really need to see teachers is when they are obstructed and need help. Students do not need teachers to be in the class to tell them the lesson contents (Jitra Sukjaroen, 2013) since in the present, as mentioned before, our world has entered the age of news and data therefore learners are able to search those content themselves. Moreover, the use of information technology does not mean only teachers use information technology as a media for learners to learn but it also includes the increase of opportunities for learners to use information technology in searching for data and knowledge and able to create their own knowledge, exchange and promulgate their knowledge, as well as apply the use of information technology in various activities whether it would be in their studies, extracurricular activities or daily life.

From the Flipped Classroom teaching principle, it can be seen that Google Apps for Education can be applied to use in Flipped Classroom learning activities since Google Apps for Education is a free of charge application, in addition to being a tool that helps support education promoting teamwork without having time and place limitations through the use of the cloud system. Users can create, edit and present, as well as exchange concepts through document files at any place, any time. They can access various handouts using all types of devices whether it'd be computers, tablets or mobile phones. Teachers and learners can create content or spread knowledge to people around the world in videos through YouTube or in website format through Google Site. It also promotes interaction between learners and teachers and between learners and learners by communicating both individually and in groups through hanging out outside the classroom (Passkorn Roungrong and Monchaya Hwancha-aim, 2015). Learners can also apply various Applications in their studies of any study field, which is a guide in teaching management that is in accordance with the National Education Act of B.E. 2542 (1999) that said teaching management must be set on the principle that all learners have the ability to learn and develop themselves and learners are the most important. Education process must promote learners to be able to develop naturally. Teachers must promote and develop learners by focusing on the learners. Therefore it is in accordance to the Flipped Classroom in which teachers are only supporters who encourage learners to learn by using technology such as Google Apps for Education to respond to the teaching model and enable learners to use and apply Google Apps for Education in education and daily life even in the future.

From the Background and Rationale above, there became interest in studying the effects of learning management by Flipped Classroom with Google Apps for Education to

skill development of create publications with Microsoft Publisher 2007 for grade 9th students at Demonstration School of Khon Kaen University in Secondary Education (Modindaeng), leading to efficient learning, skill development in creating publications and using information technology of the learners to use in the future and to become a guide for educators, teachers, related personnel, as well as interested persons, so that they can apply the concept in learning management by Flipped Classroom with Google Apps for Education to continue on developing learning management.

1.2 Research Objective

1.2.1 To study the effects of learning management by Flipped Classroom with Google Apps for Education on create publications with Microsoft Publisher 2007 for grade 9th students at Demonstration School of Khon Kaen University in Secondary Education (Modindaeng)

1.2.2 To study the opinions of grade 9th students at Demonstration School of Khon Kaen University in Secondary Education (Modindaeng) towards the learning management by Flipped Classroom with Google Apps for Education on create publications with Microsoft Publisher 2007

Scope of the Research

The scope of the results of learning management by Flipped Classroom with Google Apps for Education on create publications with Microsoft Publisher 2 0 0 7 for grade 9 th students at Demonstration School of Khon Kaen University in Secondary Education (Modindaeng) is as follow;

1.1 Target Group is 39 grade 9th class 4 students in semester 1 at Demonstration School of Khon Kaen University in Secondary Education (Modindaeng), Muang District, Khon Kaen Province. Purposive sample selection was used in choosing the target group. Said classroom has all the characteristics needed for the research. It is a classroom with varied abilities with diverse characters in learners. Each student all has different grades, whether it'd be good or average to low grades.

1.2 Variables

Independent Variable is learning model by Flipped Classroom with Google Apps for Education on create publications with Microsoft Publisher 2007 for grade 9th students at Demonstration School of Khon Kaen University in Secondary Education (Modindaeng)

Dependent Variables are as follow;

1) The effects of learning management by Flipped Classroom with Google Apps for Education on create publications with Microsoft Publisher 2007 for grade 9th students at Demonstration School of Khon Kaen University in Secondary Education (Modindaeng)

2) The opinions of grade 9th students at Demonstration School of Khon Kaen University in Secondary Education (Modindaeng) towards Flipped Classroom with Google Apps for Education on create publications with Microsoft Publisher 2007

1.3 Content used in the study is computer course (work creation with applied program) in the Work and Technology Department, grade 9 required course with a credit of 0.5, learning unit 7 on Work Publication with Microsoft Publisher 2007.

Study Design

This research is a quasi-experimental design using pre-experimental design with a one shot case study (Ladda Ayawong, 2000). It can be shown in a diagram as follow;

When X stands for Flipped Classroom with Google Apps for Education on create publications with Microsoft Publisher 2007

O stands for learning results and opinions of learners towards Flipped Classroom with Google Apps for Education

3.4 Tools

Tools used in this study are divided into 2 types which are tools used in the experiment and tools used in data collection, as follow;

3.4.1 Experiment tools is learning management by Flipped Classroom with Google Apps for Education on create publications with Microsoft Publisher 2007 for grade 9th students at Demonstration School of Khon Kaen University in Secondary Education (Modindaeng) consisting of learning plans on Flipped Classroom and learning media using Google Apps for Education

3.4.2 Data collection tools are assessment papers, assessment papers of practical skills, and student opinions survey forms. Details are as follow;

3.4.2.1 Assessment Papers with 40 multiple choice questions with 4 options on create publication with Microsoft Publisher 2007

3.4.2.2 Assessment Papers of Practical Skills to use as a cumulative score for the students in the practical skills during the class. A Scoring Rubric, Analytic Rubrics type, was used to give scoring that is divided or characteristic components of the work or process. Rating scale was used then the scores in each part or the characteristic components were totaled together to become the total score.

3.4.2.4 Opinions Survey Forms were created after learning Flipped Classroom with Google Apps for Education on create publications with Microsoft Publisher 2007. The survey form is divided into 4 aspects including 1) Content, 2) Learning media, 3) Learning management and 4) Other comments.

3.5 Data Collection

Data collection in this research was done by the researcher by holding a Flipped Classroom with Google Apps for Education on create publications with Microsoft Publisher 2007 with the target group in semester 1.

3.6 Data Analysis and Statistics used in Data Analysis

3.6.1 Data Analysis

The data analysis in this research was analyzed from the data collected as follow;

3.6.1.1 The effects of the learners in Flipped Classroom with Google Apps for Education on create publications with Microsoft Publisher 2007 used data from the results of the assessment paper of practical skills cumulative score in class and scores from the assessment paper will be used in the data analysis by using basic statistics which are mean ($\bar{x}$), standard deviation (S.D.), min, max, frequency and percentage.

3.6.1.2 The opinions of grade 9th students at Demonstration School of Khon Kaen University in Secondary Education (Modindaeng) towards Flipped Classroom with Google Apps for Education on create publications with Microsoft Publisher 2007. Data from the opinions survey forms were used in data analysis by using basic statistics which are frequency, percentage and quantitative analysis by data interpretation.

3.6.2 Statistics used in Data Analysis

Basic statistics are mean ($\bar{x}$), standard deviation (S.D.), min, max, frequency, percentage and quantitative analysis by data interpretation.

Research Results

The objective of this research is to study the learning results and student opinions of learning management by Flipped Classroom with Google Apps for Education on create publications with Microsoft Publisher 2007 for grade 9th students at Demonstration School of Khon Kaen University in Secondary Education (Modindaeng).

The results according to data collection are as follow;

1. The effects of learning management by Flipped Classroom with Google Apps for Education on create publications with Microsoft Publisher 2007 for grade 9th students at Demonstration School of Khon Kaen University in Secondary Education (Modindaeng).

In this research, data was collected to study the learning results of students on create publications with Microsoft Publisher 2007 after receiving a class with Flipped Classroom with Google Apps for Education. Data from the assessment paper of practical skills and assessment paper was used, with results as follow;

1 . 1 Learning achievement of students on create publications with Microsoft Publisher 2007 after receiving a class with Flipped Classroom with Google Apps for Education showed individual scores, min, max, mean and standard deviation.

Learning achievement of learners in Flipped Classroom with Google Apps for Education on create publications with Microsoft Publisher 2007 found that students had the lowest score of 28, and highest score of 91. The mean was 70.21 points and the standard deviation was 12.39 from a total of 39 students.

1 .2 Percentage of learning achievement of learners according to set criterion in Flipped Classroom with Google Apps for Education on create publications with Microsoft Publisher 2007 presented the percentage of learning achievement of learners according to set criterion on create publications with Microsoft Publisher 2007 after receiving a class with Flipped Classroom with Google Apps for Education found that from a total of 39 students a majority of students have learning achievement at good level, with 17 students scores in the 70 – 79 range (43.59%). Following that is in the medium level and very good level at 28.21% and 15.38% respectively. There were 3 students (7.69%) that did not pass the set criterion with a score lower than 50.

2 . Results of studying the opinions of grade 9th students at Demonstration School of Khon Kaen University in Secondary Education (Modindaeng) towards learning management by Flipped Classroom with Google Apps for Education on create publications with Microsoft Publisher 2007

From studying the opinions of 39 class 3/4 students at Demonstration School of Khon Kaen University in Secondary Education (Modindaeng) after receiving 4 classes of Flipped Classroom with Google Apps for Education on create publications with Microsoft Publisher 2007, opinions survey forms were created. The survey form is divided into 4 aspects which are 1) Content with 3 questions, 2) Learning media with 4 questions, 3) Learning management with 3 questions and 4) Other comments to collect data which received the results as follow;

2.1 Learners Opinions Results in Content Aspect

The study of learners opinions in content aspect after receiving classes of Flipped Classroom with Google Apps for Education on create publications with Microsoft Publisher 2007 derived from the 4 questions in the opinions survey forms found that most students

agree with the following topics 1) Content is clear and covers an appropriate amount of content 2) Content is concise, easy to understand, arranged in order from easy to difficult and 3) Content can be applied to use in everyday life at 97.44%, 89.74% and 79.49% respectively.

2.2 Learners Opinions Results in Learning Media Aspect

The study of learners opinions in learning media aspect after receiving classes of Flipped Classroom with Google Apps for Education on create publications with Microsoft Publisher 2007 derived from the 4 questions in the opinions survey forms found that most students agree with the following topics 1) Handouts and videos were interesting and attractive 2) Characters, pictures and explanations were clear, appropriate and easy to understand 3) Handouts and video can be accessed easily anytime anywhere and 4) Handouts and videos were easy to access and possible for self-study at 56.41%, 92.31%, 76.92% and 87.12% respectively.

2.3 Learners Opinions Results in Learning Management Aspect

The study of learners opinions in learning management aspect after receiving classes of Flipped Classroom with Google Apps for Education on create publications with Microsoft Publisher 2007 derived from the 4 questions in the opinions survey forms found that most students agree with the following topics 1) Taking notes after learning outside the classroom is a heavy and inconvenient burden 2) Learning outside the classroom earlier allows them to do activities in the classroom successfully and 3) Doing activities inside the classroom with a teacher allowed them to understand more at 69.23%, 87.18% and 89.74% respectively.

2.4 Learners Opinions Results in Other Comments after receiving classes of Flipped Classroom with Google Apps for Education on create publications with Microsoft Publisher 2007 can be interpret from data answered by learners in the survey forms as follow;

Flipped Classroom is a teaching method that is suitable to teach the content on create publications with Microsoft Publisher 2007. When learners have studied content before the class enables them to understand the content more, have more time to put the knowledge to real practice in the classroom, have fun in doing work since there is enough time, as well as able to learn various techniques. When there is a problem or questions after the study, they can ask the teacher during class. However sometimes learners did not study before class, so they cannot create publications or did not take notes after the study causing them to forget some steps in the creation of publications during work in class leading to problems during practice.

Results Conclusion

From the study of the results, they can be concluded as follow;

1.1 Learning achievement of grade 9 th students at Demonstration School of Khon Kaen University in Secondary Education (Modindaeng) that has learned in Flipped Classroom with Google Apps for Education on create publications with Microsoft Publisher 2007

The study of the learning achievement of learners after receiving classes of Flipped Classroom with Google Apps for Education on create publications with Microsoft Publisher 2007, learning management according to the 4 learning plans and data collection using assessment papers of practical skills and assessment papers were carried out. The tools were used to collect data from the target group which is 39 grade 9th students at Demonstration School of Khon Kaen University in Secondary Education (Modindaeng) in semester 1. Scores from the assessment papers of practical skills and assessment papers on learners learning achievement were analyzed with basic statistics. Results found that students had the

lowest score of 28 and highest score of 91, a mean of 70.21 points from a total of 100 points and a standard deviation of 12.39. When the learners learning achievement is distributed into frequencies according to the set criterion it is found that most students have a good level of learning achievement, with 17 students in the score range of 70 – 79 (43.59%), following that is the medium level and very good level at 28.21 and 15.38% respectively. There were 3 students (7.69%) whose score did not pass the set criterion with a score lower than 50 points.

1.2 Opinions of Grade 9th Students at Demonstration School of Khon Kaen University in Secondary Education (Modindaeng) towards the learning management of Flipped Classroom with Google Apps for Education on create publications with Microsoft Publisher 2007

The study of opinions of grade 9th students at Demonstration School of Khon Kaen University in Secondary Education (Modindaeng) towards the learning management of Flipped Classroom with Google Apps for Education on create publications with Microsoft Publisher 2007 according to the 4 learning plans. After all 4 learning plans, data on the opinions of learners was collected with the target group of 39 grade 9th students at Demonstration School of Khon Kaen University in Secondary Education (Modindaeng) in semester 1. Results were analyzed with basic statistics and data interpretation and results found that most students agree with the following topics 1) Content is clear and covers an appropriate amount of content at 97.44% 2) Content is concise, easy to understand, arranged in order from easy to difficult at 89.74% and 3) Content can be applied to use in everyday life at 79.49%. In the learning media aspect, 1) Handouts and videos were interesting and attractive at 56.41% 2) Characters, pictures and explanations were clear, appropriate and easy to understand at 92.31% 3) Handouts and video can be accessed easily anytime anywhere at 76.92% and 4) Handouts and videos were easy to access and possible for self-study at 87.12%. In the learning management aspect, most students agree with the following topics 1) Taking notes after learning outside the classroom is a heavy and inconvenient burden at 69.23% 2) Learning outside the classroom earlier allows them to do activities in the classroom successfully 87.18% and 3) Doing activities inside the classroom with a teacher allowed them to understand more at 89.74%. From the 3 aspects aforementioned, there are also other comments learners have answered into the survey. The answers have been interpreted as follow; Flipped Classroom is a teaching method that is suitable to teach the content on create publications with Microsoft Publisher 2007. When learners have studied content before the class enables them to understand the content more, have more time to put the knowledge to real practice in the classroom, have fun in doing work since there is enough time, as well as able to learn various techniques. When there is a problem or questions after the study, they can ask the teacher during class. However sometimes learners did not study before class, so they cannot create publications or did not take notes after the study causing them to forget some steps in the creation of publications during work in class leading to problems during practice.

Research Results Discussion

1. Learning achievement of grade 9 th students at Demonstration School of Khon Kaen University in Secondary Education (Modindaeng) that has learned in Flipped Classroom with Google Apps for Education on create publications with Microsoft Publisher 2007

The study of the learning achievement of learners after receiving classes of Flipped Classroom with Google Apps for Education on create publications with Microsoft Publisher 2007, learning management according to the 4 learning plans and data collection using assessment papers of practical skills and assessment papers were carried out. The tools were

used to collect data from the target group which is 39 grade 9th students at Demonstration School of Khon Kaen University in Secondary Education (Modindaeng) in semester 1. Scores from the assessment papers of practical skills and assessment papers on learners learning achievement were analyzed with basic statistics. Results found that students had a mean of 70.21 points from a total of 100 points and a standard deviation of 12.39. When the learners learning achievement is distributed into frequencies according to the set criterion it is found that most students have a good level of learning achievement, with 17 students in the score range of 70 – 79 (43.59%). From what has been mentioned, it can be seen that the learning achievement of most students are in the good level but some also have low learning achievements. This could be because the Flipped Classroom learning management uses information technology (Pangleela Burapapichitpai, n.d). Google Apps for Education which are YouTube, Google Drive and Gmail were used to teach, which had allowed learners to self-study outside of class no matter the place or time. When in class it is time for actual practice. Learners have had time to completely work on their creation that was the mission given by the teacher. During the real practice is when students will be faced with obstructing problems, have questions and needs help from the teacher. The teacher will be able to help and give beneficial advice to the students freely. In this learning management, teachers do not need to waste limited time to transfer content to the students and students also do not need teachers to be in class transferring content (Jitra Sukjaroen,2 013), but rather wants someone to give advice and guidance during work. In addition from the research results, it can be seen that some learners still have learning achievements in the low level which could be due to the learning media access factor. It was found that some students could not conveniently access the media since they do not have devices to connect to the internet and the factor of learners not having any motivation to learn. This research is in accordance with Lanlalit Iam-amnauysuk (2013) research on Creating Media on Mobile Computer to be subject to the introduction of digital animation that stated that learners have test scores post-class higher than pre-class, from the working assessment of learners when compared to the set criterion of a good level score.

2. Opinions of Grade 9th Students at Demonstration School of Khon Kaen University in Secondary Education (Modindaeng) towards the learning management of Flipped Classroom with Google Apps for Education on create publications with Microsoft Publisher 2007

The study of opinions of grade 9th students at Demonstration School of Khon Kaen University in Secondary Education (Modindaeng) towards the learning management of Flipped Classroom with Google Apps for Education on create publications with Microsoft Publisher 2007 according to the 4 learning plans. After all 4 learning plans, data on the opinions of learners was collected with the target group of 39 grade 9th students at Demonstration School of Khon Kaen University in Secondary Education (Modindaeng) in semester 1. Results were analyzed with basic statistics and data interpretation. Results were divided into 3 aspects which are 1) Content, 2) Learning media and 3) Learning management. Students have the following opinions: 1) Content is clear, covers an appropriate amount of content, concise, easy to understand, is arranged in order from easy to difficult and can be applied to use in everyday life 2) Handouts and videos were interesting and attractive, characters, pictures and explanations were clear, appropriate, easy to understand, can be accessed easily anytime anywhere, allow students to learn quickly and possible for self-study and 3) Learning management found that learning outside the classroom earlier allows them to do activities in the classroom successfully and doing activities inside the classroom with a teacher allowed them to understand more. This could be because Flipped Classroom has changed the role of teachers from being content transferring to someone who gives advice

and guidance in learning missions (Vicharn, 2013), as well as using information technology media to transfer content for leaners to self-study outside of class through YouTube and Google Drive allows learners freedom to learn and learn according to their own abilities without having the limitations of time and place (Passakorn and Monchaya, 2015). Students can also hand in work through Gmail, as well as receive a response immediately as if in an actual classroom. In terms of learning management, students find taking notes after learning outside the classroom is a heavy and inconvenient burden. This could be because students have both numerous homework and activities learnt in various courses so assigning the work of taking notes before class increased the work burden of the learners. Said results were in accordance with Jill Zarestky and Wolfgang Bangerth (2014) who had studied teaching High Performance Computing: Lessons from a flipped classroom, project-based course on finite element methods which found that learning management that uses Flipped Classroom and uses projects as a foundation enables students to participate into the study more deeply, increase motivation, freedom and diligence in doing the projects and help facilitates many other aspects that allows learners to communicate with teachers to share knowledge on the topics covered in class by using technology.

1.3 Suggestions

1.3.1 Suggestions for Results Implementation

1) Designing and developing learning media in the form of a video that was promulgated through YouTube and Google Drive can be used as a media to hold activities for learners and people who are interested in studying the use of this program can study and learn from this learning media.

2) When applying the learning management processes in this research, context of the school, characteristic of the learners, learner ability and learner readiness in terms of equipment that can connect to the internet so that learners can access the content must be considered. If applied with students who do not have the equipment it can lead to a deficit in their learning.

3) Creating understanding with learners before the class is important. Learners must understanding the learning management process of Flipped Classroom and accept participation in the learning activities so that the learning management process goes smoothly and receives cooperation.

1.3.2 Suggestions for Further Research

1) This research procedure can be applied to the learning management of other content but the context of the school, characteristic and potential of the learners and the type of content must be suitable.

2) Other learning media can be applied such as Facebook, to help support learners learn by themselves, facilitate easy access and support the learning management of Flipped Classroom.

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Study Characterizes Of 10th Grade Students' Algebraic Thinking in Classroom by Using Open Approach

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Abstract

The purpose if this research was to analyze characterizes of 10th grade students' algebraic thinking in classroom by using Open Approach. The research design was a qualitative method through teaching experiment by using Inprasitha's Open Approach (2011). The subjects of the research were 30 tenth grade students who were studying in second semester of 2016 school year at Demonstration School of Khon Kaen University. The data of experiment by using Inprasitha's Open Approach (2011). The data of this research were collected by 5 lesson plans, in depth interview and field note. The researcher used this model of teaching for focusing on the development of self-problem solving ability of students, and used Lins's framework (1992) to analyze an algebraic thinking. The study results revealed the 3 characterizes of students' algebraic thinking as following: 1) thinking arithmetically, 2) thinking internally and 3) thinking analytically

Keywords: *Algebraic Thinking, Open Approach*

Introduction

For current teaching and learning should be in the form of open learning approach in order that students learn and use for future learning and the context of school mathematics, teachers should consider that how to motivate students to find the best way to their live. There is a good physical and mental holistic to support communities based on skills, concepts, and mathematical knowledge and understanding (Nohda, 1984 cited in Inprasitha, 2015). From the core curriculum of basic education in 2008, mathematics is very important to development human thinking system such as creativity, think logically, systematically, analyze problems or situations carefully, predict, plan, and solve problems correctly and appropriately. In addition, mathematics also improve the human beings. It has a balance both physically, mentally, intellectually and emotionally. (Ministry of Education, 2010). Although students have more educational opportunities, and the literacy rate and the average level of education of Thais tend to be higher, but the learning achievement has declined. Whether it is the Ordinary National Education Test found that the average score in mathematics decrease dramatically (Institute for the Promotion of Teaching Science and Technology, 2011) or international academic achievement tests from the PISA (Program for International Student Assessment) and TIMSS (Trends in International Mathematics and Science Study) which are the assessment of thinking and reasoning, found that Thai students have a lower average score on math (Martin, Mullis, Foy & Stanco, 2012).

The important reason is the low academic achievement of student. It may come from themselves that is students lack the skills, knowledge, and thinking process skill. Some students understand that they can do the exercises. If a student does not understand, they

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cannot do the exercises. In addition, teaching is one of the factors that discourage students from studying mathematics because the most teachers teach by a teacher-centre, and teachers lack the skills, knowledge and attitudes (Khammanee, 2009 cited in Ministry of Education, 2010). In the traditional classroom, teachers teach by using the lecture to complete the topics in the textbook. If the teacher does not practice, they understood that they did not do their duties completely. Activities that are emphasized testing this cause the student's personal learning never get the attention from teachers. Neglect about personal-learning processes while students solve problem. It blocks opportunities for students to develop their advanced thinking skills of students. (Inprasitha, 2015)

From the problems above, Inprasitha (2003) has introduced educational innovation to change paradigms of teaching by the new teaching method. It is called "Open Approach", which has four important steps: (1) Posing open-ended problem that allows students to express a variety of ways of thinking. (2) students' self-learning by giving time to think, do not focus on the answer, but focus on the process that how to solve. (3) Whole class discussion and comparison that is students present ideas in the class to learn the concepts and (4) Summarization through connecting students' mathematical ideas emerged in the classroom that is the teacher will gather students' ideas in order to a conclusion. The heart of this teaching method focuses on students' individual difference have been recognized, especially different thinking. Teachers will teach how to activate the students think for solve the problem in class.

Windsor (2010) said that an important element of mathematical thinking is Algebraic Thinking, which corresponds to the study of Kaput (1993) said that involves the construction and representation of patterns and regularities, deliberate generalization, and most important, active exploration and conjecture. In addition, Booker and Windsor (2010) discuss algebraic thinking that should not be seen as a new topic added to the curriculum, but it should be a mathematical issue, so that students' opportunities for further learning help to make the solution is more effective. He believes that attempts to understand abstract symbols without the basics of algebraic thinking can lead to difficulty, when students study mathematics.

Because of algebraic thinking is so abstract, it is difficult to understand. Lins (1992) has collected and divided algebraic thinking into 3 characterizes: (1) Thinking arithmetically (2) Thinking internally and (3) Thinking analytically for explaining the important aspects of algebraic thinking. In addition, there are researchers who are interested in studying algebraic thinking in the context of mathematics classroom in Thailand, such as Tippanet (2015) explore Students' Algebraic Thinking in Classroom Using Lesson Study and Open Approach. The results show that students have three levels of algebraic thinking: Level 0, 1 and 2 of algebra (Algebraization). Bunlang (2015) study the Role of Questioning in Classroom using Lesson Study and Open Approach.

From the above, the researcher sees that, Open Approach is an innovation that encourages students to think more. Due to the innovation, emphasis is placed on students' individual difference have been recognized, especially different thinking. Algebraic thinking is also an important element of mathematical reasoning and reduces the difficulty of explaining and reasoning, in addition Tippanate (2015) studies and explains the level of thinking. It was found that the students had three levels of algebraic thinking: level 0 was to explain the basic relationship or behavioural expression for communication. An expression with a symbol or a language shows the related between properties and numbers. Level 2 Students can find answers from problem situations. The answer can be written in generalization. However, due to the description of algebraic thinking at each level, there is unclearly. The researcher was interested in studying characterizes of 10th grade students'

algebraic thinking in classroom by using Open Approach. To obtain a pattern or description of the student's algebraic thinking as a guideline for further learning.

Research purposes

This study was conducted to analyze characterizes of 10th grade students' algebraic thinking in classroom by using Open Approach.

Literature Review

(1) Algebraic Thinking is the students' thinking processes in describing rules, relationships, solving unknown quantity problems, and recognizing the rationality. Characterizes of students' algebraic thinking of Lins (1992) would be considered into 3 Types: (1) Thinking arithmetically (2) Thinking internally and (3) Thinking analytically

(2) Open Approach is a teaching approach which students' individual difference have been recognized, especially different thinking according to Inprasitha (2011) by opened-ended activities includes;

First step*:* Posing opened-ended problem is the method that teachers post the opened-ended problems during the class then pose the questions together with worksheets distribution.

Second step*:* Students' self-learning is the process that the students solve the opened-ended problem into worksheet writings then conduct the group discussion. The researchers and co-researchers would be the observers and note the students' concept without any interference or suggestion.

Third step*:* Whole class discussion and comparison is the individual concept presentation from each group via worksheets. The teachers would sort out from ordinary to remote possible concepts in order to let students ask and suggest about their concepts.

Fourth step*:* Summarization through connecting students' mathematical ideas emerged in the classroom is the process that the teachers summarize based on students' concept although there are wrong or incomplete concepts. Teachers would positively consider and improve these concepts from students' suggestion.

Design/Procedure

1. The context of representative school

Demonstration School of Khon Kaen University 123 Moo16 Soi Mittapap 8/5 Mittapap Rd., Nai-Muang, Muang District, Khon Kaen 40002,Thailand. In 2009, This school participated in The Project of Development of Student's Mathematics Higher-Order Thinking at North East of Thailand and Open Approach and Lesson Study are used in teaching and learning in mathematics with Grade 1 and have continued to the present.

2. Co-researcher

There are 3 participants with these following roles: Researcher is a student of Graduate School, Master of Education, Science and Technology; Major of High School Education Mathematical Teaching, Faculty of Education, Khon Kaen University who has already studied in any courses. The researcher had an opportunity to attend the second national academic seminar, mathematical education. Furthermore, the researcher also had the opportunity to practice teaching at the development project school. The researcher studied the context of this research as the "Participant as observer" who was responsible in teaching and observing during 1 semester. The researcher and observing teacher planned 5 learning plans to collect the data that focused on classroom professional development method.

There are 2 co-researchers as follows:

First co-researcher is a teacher of Demonstration School of Khon Kaen University, specialist teacher who has taught in 4th year high school education class for 15 years with Master of Education degree, who has been responsible as observing teacher for a semester.
The first co-researcher planned the learning plans and conducted the field notes by speech, solving behavior and representative students answering data collection. Moreover, the co-researcher also observed the mathematical and complicated concepts as well as students' presentation while the researcher provided open approach method and reflected the learning results.

Second co-researcher is a student of Graduate School, Master of Education, Science and Technology; Major of High School Education Mathematical Teaching, Faculty of Education, Khon Kaen University, who already studied in the courses and had an opportunity to attend the second national academic seminar, mathematical education. The second researcher also had the opportunity to observe the teaching practitioner students with open approach method at the project school and already practiced the teaching at Demonstration School of Khon Kaen University. Moreover, this co-researcher also planned the learning plan, observed the classroom and reflected the classroom result both two methods by video, zoom and protocol recording while the researcher provided an open approach method in the send level of second classroom learning cycle.

3. Target groups

The targets group were 30 secondary students from class 4/6 (Grade10), Demonstration School of Khon Kaen University, Khon Kaen province, second semester, academic year 2559 B.E. (2016).

4. Research instruments

4.1 These followings are research tools;

4.1.1) Five learning plans of Trigonometric Ratio from the conduction of researchers and co-researchers. It is managed by using 4steps of Open Approach. In this method, the problem solving skills and the thinking process of students are emphasized by using questions or situations, open-ended questions and media that correspond to problem situations.

4.1.2) 2 Video recorders, the first camera records an overview of the classroom to see the interaction between the teacher and students. The second camera records the problem solving process, behavioral details, response to show how to think and reason of students.

4.1.3) Voice recorder is using for student voice recordings. It is divided into two phases, and in the second phases will be used to interview students after each lesson.

4.1.4) Cameras are used to record the results of student activities undertaken during the student's participation in a mathematics class.

4.1.5) In-depth interviews from students were used to ask additional questions.

4.1.6) Field Note is used to record students' behavior in each step-by-step learning activity of problem solving.

4.2 The tools used to analyze the data are as follows

4.2.1) Recorded protocols both Video recorders and in-depth interviews It is the data in the voice recorder recorded by the student during solving the problem from the beginning to the end of the activity.

4.2.2) Evidence of Student's problem solving and includes the reasons for solution.

4.2.3) Data from Field Note Recording Form It is a detailed record of students' behavior and conversation while solving problems.

5. Research project setting

In first semester, the researcher and co-researchers observed the target group and had provided new classroom context base on Open Approach. This method was started by opened-end situation in order to familiarize the students.

5.1 Researcher and co-researchers provided the learning plan; "Trigonometric Ratio", and predicted the further occurrence concepts from the students.

5.2 The researcher teach by using 4 step of Open Approach as the teaching method while co-researchers and observing observed problems resolving methods, mathematical concepts, complicate occurrence concepts including the clarity of students' concepts presentation that includes four steps as follows:

First step: Open-Ended problems presentation, the research was responsible as teacher presented the open-ended situation and then teacher provided the questions and work sheets to students.

Second step: Students self-learning, students resolved the problems by themselves and discussed with their group. Teacher should try to categories the students who did not understand their problems and gave the additional samples or suggestions in order to support students' problem concepts in order to comprehend and teacher should support students' different concepts which did not intrude in students' concept meanwhile co-researchers and observing teachers observed and noted the students' concepts and did not interrupt or direct students' concept.

Third step: Classroom discussion and comparison, each students group would present their concepts through work sheets which begin from general to complicate occurrence concepts as well as give the classroom opportunity to students.

Fourth step: Students' classroom concept conclusion, teacher or students should write their work or group on board to show the class. After that, teacher would collect all concepts in spite of some concepts were similar or re-doing to encourage students assure their works. Later, teacher summarized based on students' concepts although some concepts were nor correct or complete. Teacher would criticize positively and improve these concepts through students' suggestions.

Findings/Analysis

The results of the analysis of characterizes of 10th grade students' algebraic thinking in classroom by using Open Approach appeared in each processes according to open approach of Inprasitha (2011). The researcher analyzes the data in the framework of Lins (1992), which presented three characterizes of algebraic thinking. The results are as follows.

In term of posing open-ended problem found that, there are 3 characters of students' algebraic thinking; the use of words characteristic of the thinking that students implied the use of arithmetical operations in order to produce the relationships, the student refer to the properties of the operations and the equality relation and students use unknown variable to be taken as know as part of relationships which are to be manipulated until one arrives at something already known.

In term of students self-learning, after the teacher presented the problem situation, the teacher gave out worksheets of the activity to each group. Teachers let students solve problems independently without interference, but the teacher is observing the problem solving of each student to keep track of the student's ideas. Researcher found that, there are 3 characters of students' algebraic thinking; (1) Thinking Arithmetically refers to the number for guiding to find answers. Then he uses the arithmetic operation such as multiply the three sides by the same number to adjust the numbers. For example, student refers to the number of

trigonometric ratios $30^{\circ}, 60^{\circ}$ for guiding to find answers. Then he uses the arithmetic operation. Multiply the three sides by the same number to adjust the numbers in accordance with the common trigonometric ratios. (2) Thinking Internally Students analyze problem situations by use the trigonometric ratios on the right-angled triangle as a guide for analyzing the lengths of the orthogonal opposite. By constructing an equation for the solution and referring to the properties of equality and expressing the relationship of the equation by considering the aspect ratio of the triangle. (3) Thinking Analytically Students work together to solve problems within a group, starting with a discussion. The student starts to define each side of the equilateral triangle with an unknown value to show the relation of numbers in different sides of the equilateral triangle, and write the condition. The height of pyramid is 1 meter long. Students write a line representing the height of the equilateral triangle next to the triangle. Then draw a halftone line to form a triangular shape and set the length of the line drawn perpendicular to the 1 meter long base. This shows that students can interpret the given proposition and find solutions to the problem using the unknown value first, and to simplify the problem, we refer to the Pythagorean Theorem to help solve the problem. Students indicate the relationship between the three sides of the right triangle, and write an equation to show the relationship of the data. It shows that Students have analytical thinking. Students can interpret the problem situation. Solve problems with unknown values, and specify the functions and relationships of variables.

In terms of whole class discussion and comparison found that, the teacher selects the students' ideas and then prepares them for class presentation. The teacher selects most of the students' ideas to present the first page of the class, followed by the different ideas in sequence. The concept is identical to the concept presented. Teachers let students come up with ideas of their own group and share their classmates with each other, while examining the ideas presented, found that, students can describe about how to think about solution by using arithmetic operation such as multiple and refer to rules, relationships for solving and apply to use variable for represent unknown quantity by recognizing the rationality.

In terms of summarization through connection students' mathematical ideas emerged in the classroom: teachers will conclude the entire ideas form students. Students will present their ideas in form of questioning found that, there is (1) Thinking arithmetically students use of arithmetical operations in order to produce the relationships. (2) Thinking internally students refer to the properties of equality and expressing the relationship of the equation by considering the aspect ratio of the triangle. (3) Thinking analytically students indicate the relationship between the three sides of the right triangle, and write an equation to present the relationship of the data by using unknown variable.

Conclusion

In mathematics classroom using Open Approach, teaching method focuses on students' individual difference have been recognized, especially different thinking. Because of algebraic thinking is so abstract, it is difficult to understand, but in mathematics classroom by using Open Approach, can improve opportunities for students to develop their advanced thinking skills of students especially algebraic thinking. The result found that characterizes of 10^{th} grade students' algebraic thinking show in the classroom.

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Extending Mathematical Ideas of 6th Grade Students' in Classroom Using Lesson Study and Open Approach

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Abstract

The purpose of this research is to analyze the extending student's mathematical ideas in the classroom which utilizes the Lesson Study and the Open Approach (Inprasitha, 2011). This study was the qualitative research method that emphasized on analytic description and protocol analysis. The target group was the sixth grade students in the first semester of the academic year 2016 at the Chum Chon Ban Kaeng Kro Nong Phai School where is located in Chaiyaphum province. This school has been subjected to the project for professional development of mathematics teachers through Lesson Study and Open Approach which is implemented by the center for research in mathematics education, Faculty of Education, Khon Kaen University. Lesson Study teams worked to create a lesson plan together in every friday. In each lesson plan, lesson study teams analyze the ideas of each subject, to find the way to extend the ideas and create a problematic situation that would be used in an open approach. The instruments used in data analysis were divided into 3 parts: protocols (by using a tape recorder, video camera and field note), students' work from activities and interviews.

As the results of this research, showed that in the classroom using lesson study and Open Approach students solved the mathematical problems by themselves and that make various mathematical ideas. When students exchanged their ideas with each other they communicate ideas too. Consequently, there are 3 features that result in extending the ideas , that are 1)Extension to clarify : students found rule formula, definitions, how to solve problems to be generalization 2)Extension to apply : students can bring the knowledge from the past to solve the problem on their own 3) Extension to continue : students can be extended the ideas to connect to each topic which is the higher order thinking.

Keywords: *Lesson Study, Open Approach, Extending Mathematical Ideas*

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1. Introduction

In term of previous teaching, teacher might stand in front of the classroom and educated through narrative and explained teaching (Inprasitha, 2003) that focused on Rote Learning only (Newby and others, 2000, cited on Chaicharoen, 2011). The problems solving intention classroom provides students questions solving by themselves (Inprasitha, 2014: p.108 NCTM, 2000) conformed to Inprasitha (2011: p.56). We improved the teachers cohesion that was called as the Lesson Study included 3 steps: 1) Plan, 2) Do and 3) See to apply with mathematical problems solving intention that would be called Open Approach, the method that focused on student's self-problems solving in open-ended situations included following 4 steps: 1) posing open-ended problems, 2) students-self learning, 3) whole class discussion and comparison and 4) summarization through connection students' mathematical ideas emerged in the classroom. These matters led students able to do self-mathematical discussion in several ways.

The Lesson Study and Open Approach classrooms will be managed to educate through Japanese mathematics textbooks with problem situation content presentation as the mathematical structure which intended to connect the problem situation with real world situation that appeared as students' daily routine in order to let them interpret any meanings from this situation before joining the mathematical models experience that could be illustrated as symbols, rules and formulas. It represented problem situation in form of messages with illustration or activity order with satisfied consecutive activity arrangement in order to terms definition. Any textbook exercises were set up to check the learners' problems solving comprehension in various ways and to choose the proper mathematical methods like Generalization or Extension (Japanese textbook).

Mathematical ideas, methods, and views are the supporting factors of students' mathematical ideas thus, these ideas are very important (Takahashi & Yoshida, 2012) conformed to (NTCM, 2000) that defined communication learning process standard. Mathematical idea was regarded as the key of mathematical communication with students which could be effective learning and could support mathematical ideas if students apply it through ideas connection procedures to be long-term and various learning process. Moreover, mathematical ideas also showed students' basis comprehension therefore, students' solving opinions expression is necessity (Isoda & Katagiri; 2012).

The extending students' mathematical ideas is the concept factor from initial idea through mathematical observation to mathematical comprehension development (Cengiz N. et al., 2011). It challenged students' mathematical ideas and led them do problems solving analysis and comparison methods as generalization (Fraivailling, 2001; p.457) related with Isoda & Katagiri (2012) that informed about ideas extension was the ideas and previous knowledge relation finding intention. Initial ideas qualification found that the general aspect of students' problem solving was generalization depended on basis mathematical problem solving so students could find rules, formulas, definitions and general answering method (Nohda, 2000; p.5). Mathematical ideas extension was appeared in form of specific aspect especially in general behavior change comprehension extension like students' ongoing questioning, explanation and self-ideas related to problem situation (Lisa, 2008).

As mentioned above, students' mathematical idea is necessity for learning management so we should emphasize if students apply it through idea connection procedures in order to be long-term learning it means students' mathematical ideas should be improved and extended to comprehend students. Therefore, the researcher was interested about students' idea extension within open approach classroom.

2. Research Purpose

This research aims to analyze students' mathematical idea extension in classrooms. Using Lesson Study and Open Approach

3. Terminology

3.1 Extending students' mathematical ideas is the shift from initial ideas through observation, connection comparison analysis and problems solving method through rules, formulas, definitions and general answering finding as well as mathematical tools using and would be synthesized into 3 features: 1) Extension to clarify: students found rule formula, definitions, how to solve problems to be generalization, 2) Extension to apply: students could apply their knowledge from previous learning period to solve any problems by themselves and 3) Extension to continue : students can be extended the ideas to connect to each topic which is the higher order thinking.

3.2 Open Approach is the teachers' teaching approach and students' role that focuses on students'-self open-ended problems solving with various ideas that regarded as important tool for extension students' idea according to an idea of Inprasitha (2011). It includes 4 steps: 1) posing open-ended problems, 2) students' self-learning, 3) whole class disdussion and comparison and 4) summarization through connection students' mathematical ideas emerged in the classroom.

3.3 Lesson Study means cooperation from teacher, researcher and assistant researcher consecutive cohesion into 3 steps according to an idea of Inprasitha (2011) as follows: 1) common learning management plan it means reading textbooks content and analysis to activate problem situation for students' idea, 2) the teaching observation is the practical learning management plan adaptation in open approach classroom with the researcher and assistant researcher as the observers and 3) whole class discussion and reflection, teacher and observers conjointly discuss and reflect the learning management plan results, verify related ideas and extend the observation ideas to improve the research learning. This step would be conducted once a week.

4. Research Methodology

4.1 Classroom context for research

This research applies the context of students' mathematical advance ideas development project in the area of northeastern with Lesson Study and Open Approach methods as the innovation of Center for Research in Mathematics Education, Faculty of Education, Khon Kaen University. The data was collected from Bankaengkhrononghphai School where attended the students' mathematical advance ideas development project in the area of northeastern under the management and advice from the experts of Center for Research in Mathematics Education, Faculty of Education, Khon Kaen University since 2009.

4.2 Target group

The target group is grade 6/4 students from Bankaengkhrononghphai School, Kaeng Khro District, Chaiyaphum Province, to collect the data in first semester of 2016 academic year. These students had been educated through Lesson Study and Open Approach since they were in grade 1. In each teaching period, open-ended problem situation that focused on work group and ideas presentation was conducted.

4.3 Research tool

The research data collection and analysis tools are as follows:

4.3.1 Data collection tools are learning management plans, filed notes, interviewing forms, activity worksheets and sound, videos and slides recorders.

4.3.2 Data analysis tools are divided into 3 categories: first; Protocol analysis from sound and video recorders and field notes and second; students' woks analysis and third; interviewing forms analysis.

4.4 Data collection

This research, the researcher collected the data as following steps:

4.4.1 School context study is the method that researcher studied the context through school and classrooms by students' behavior observation during classroom problems solving. The researcher asked for additional data from class and mathematical teachers.

4.4.2 The researcher defined the target group by students' works analysis as well as asked and observed the students' learning behavior from teacher. We found that, the target students expressed various mathematical ideas and had the good views of mathematical learning with their ideas explanation encourage within the work groups.

4.4.3 In term of learning management planning, the researcher, assistant researcher and teachers set up the learning management plans that emphasized on content ideas analysis and it was verified by teaching management experts then improved according to observation and advices and following represent to the experts.

4.4.4 Whole class learning management observation: researcher and assistant researchers collected the data during the Lesson Study learning observation procedure, teacher educated and researcher and assistant researchers performed their roles and did not intervene in teachers' learning management.

4.4.5 Whole class learning management reflection: researcher and assistant researchers reflected the students' ideas and ideas extension during the Lesson Study and Open Approach management observation. This method was the whole class ideas collection to be applied as the data analysis method.

4.5 Data analysis

The researcher applied the students' ideas recording data in various forms to analyze as follows:

4.5.1Students' work illustrations are the slides that were recorded during the classroom activities. The researcher applied the students' works and field notes data and the assistants recorded the learning observation procedures and reflected the Lesson Study learning management results.

4.5.2 Field notes data is the students' problem solving and mathematical ideas detailed recording as well as the other behaviors from the whole class problem solving process and idea extension recording. The researcher applied the field notes data to be consisted with students' activity works data in form of sides in order to interpret the sound messages from video recorder.

4.5.3 The data from video recorder was drawn from activity videos recording. The researcher applied this data to interpret the speeches and behaviors in forms of messages and Protocol from students to show to their teacher.

4.5.4 Sound data from sound recorder was recorded during target students' classroom activity and interviewing (non-structure). The researcher applied this data to interpret the speeches and behaviors from video recorder in order to be Protocol.

5. Conclusion

After analyzed the students' mathematical ideas extension from Lesson Study and Open Approach classroom (lesson: Capacity) found that, problem situation is students create box model with 200 square centimeters capacity with length, width and height according to the assigned capacity. This model should be created in various patterns at most and students should show the capacity calculation from each model pattern. From this open-ended situation, we found the following students' mathematical ideas extension:

1) Clear explanation, students could find rules, formulas, definitions and general answering (Generalization).

During the target students' interviewing, the researcher asked "about 200 square centimeters capacity box model creation, what did all of you learn, find or conclude?" This question showed that the researcher wanted to know did students learn from summarization or rules by themselves or not so students could be able to learn by themselves from protocol's rules, summarization and new knowledge. One of the students said that ***"I realized about the relation between factorization and drawing box picture. So you can factorize and then create the box in various patterns"*** and the second student said ***"As she said, I think 200 square centimeters capacity is from width multiplies with length and height so above is width, below is length and height is each box (she pointed at her worksheet, picture 5)".***

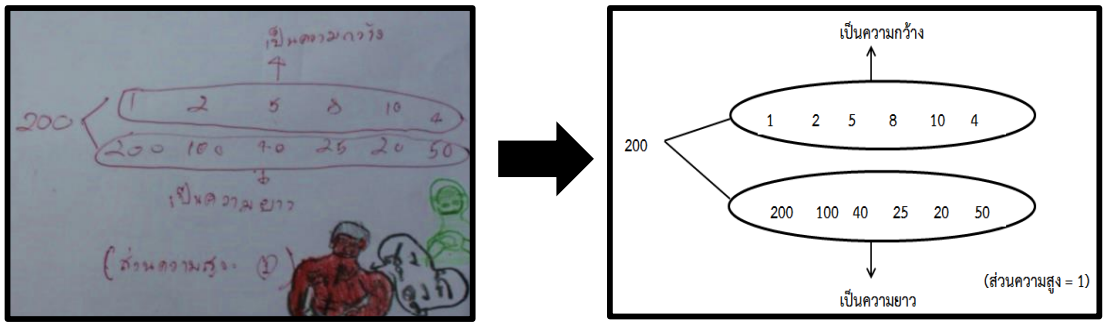

Figure 1: students' drawing works

In addition, the researcher also asked "Do anyone think besides your friends or want to add anything else" so, the third student replied ***"The 200 capacity is equal but width and length are different."*** The narration of target students showed us about more clear ideas extension from the findings, rules, summarizations or new knowledge by themselves.

2) Applied extension: students could apply previous knowledge from the last period to solve the problems by themselves.

Students could be able to apply the other data through 200 square centimeters capacity box drawing which assigned width, length and height, the data from previous learning according to following Protocols:

Item 43, 1st student: Im, why you did factorization, how should I do later?

Item 45, 2nd student: ***We will draw the model like 20 as length, 10 as width and 1 as height so we will have 200*** (filling in the worksheet).

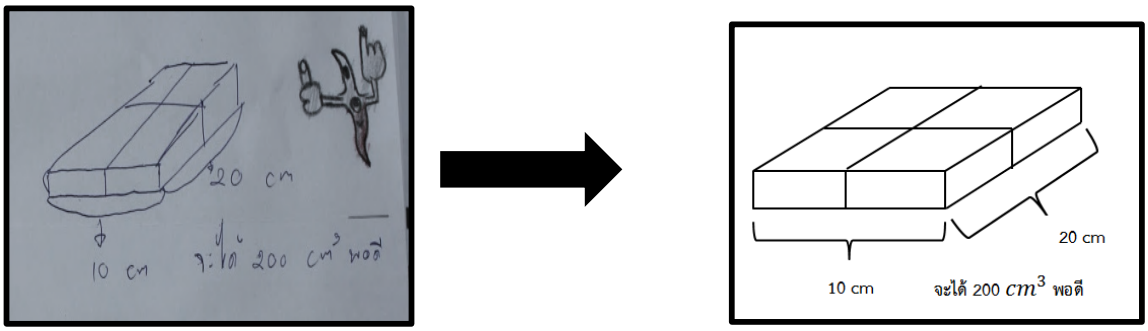

Figure 2: students' applied extension drawing works

From Item 45; *"We will draw the model like 20 as length, 10 as width and 1 as height so we will have 200"* with the second drawing works reflected that students could apply the previous knowledge from the last period to solve problems by themselves through their familiar data to draw 200 square centimeters box model with proper assigned width, length and height and conformed with the representation forms of above Protocol's factorization so it was considered as applied ideas extension.

3) Following extension: students could extend their ideas to connect with the other matters and it would be regarded as an advance idea. After students drawn the 200 square centimeters capacity boxes, students tried to draw the other boxes patterns pictures through their comparison understanding into 6 pictures as the following Protocols:

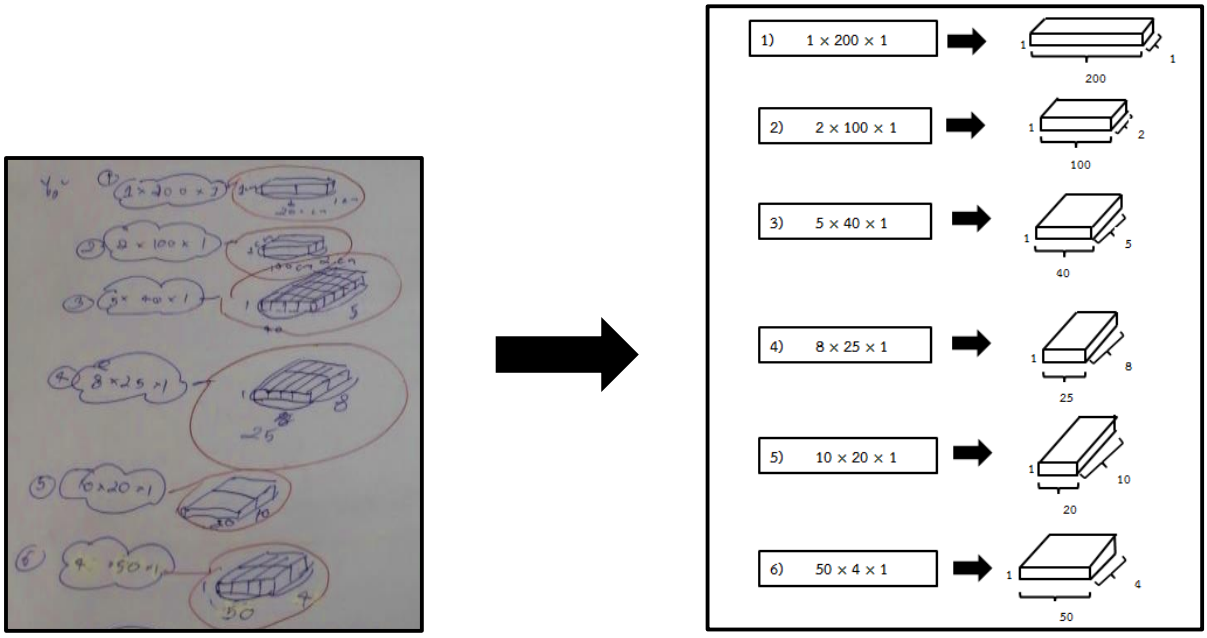

Figure 3: students' following extension drawing works

Item 58, 2nd student: The other patterns will be… (Plenty explanation each pattern and filling into the worksheets)

Item 69, 1st student: You, what will you draw? (Pointed to the worksheet)

Item 70, 2nd student: ***I will let it extends the other.***

From Item 58, the second student compared between the factorization and the first pattern box model creation to adapt or extend the other 6 box patterns ideas according to figure 4 and Item 70 that the second student replied ***"I will let it extends the other"*** it was the confirmation message that he could apply previous problems solving to be extended or adapted with other problems. Students could apply the various methods to extend their ideas so it was considered as following extension.

6. Discussion

In term of the results discussion found that, Lesson Study and Open Approach classrooms support the students' ideas extension into 3 aspects in order to be considered and students have various and extendable ideas. Students could find rules, formulas, definitions and general problems solving methods (Generalization). Students could apply the previous knowledge to adapt with self-problems solving and they could extend the ideas to connect with the other matters and would be regarded as an advance idea which conformed to Lisa (2008). We studied the relation between students' behavior and mathematical ideas extension (According to Pirie-Kieren). The result found that, some student's behavior would present as the specific matter that regarded as the key of mathematical ideas development like Cengiz et al. (2011). We also studied the students' mathematical ideas extension from the work group activities. These activities challenged the students' mathematical ideas extension comprehension providing and mathematical knowledge that supported teacher to apply it for the students' ideas extension.

7. Recommendation

In the next research, should study mathematical teaching knowledge to let teachers activate the students' ideas extension since teachers are the key of students' various ideas showing activation and could extend the further ideas.

8.Acknowledgment

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Mathematical Problem Solving Ability of Students in Classroom Using Open Approach in Demonstration Primary School, Pakse Teacher Training College, Lao PDR

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ABSTRACT

The purpose of this research was to explore mathematical problem solving ability of students in the classroom using "Open Approach" context by the concept of Inprasitha (2011). This study was conducted in a Primary Demonstration School in Pakse Teacher Training College, Lao People's Democratic Republic. The research was conducted in the second semester, the academic year 2017. The target group was 8 students divided into two groups of four. The method of study was a qualitative research, collecting data using lesson plans, video record, voice record and classroom observation. The data analysis emphasized on protocol and analytic description supported by student's worksheet, pictures, and observation result, then consideration used research framework of Lithner (2010) in three steps: 1) Interpret, 2) Do and Use and 3) Judge.

The research found that: Mathematical problem solving ability of students in classroom using "Open Approach" in four steps 1) Posing the open-ended problem found in step (1) Interpret: Student's behavior to understand the problem situation or questions 2) Students' self-learning found all steps included: (1) Interpret: Students understood problem situation or question but the interpret sometimes occurred (2) Do and Use: Students used many strategies to solve the problem and (3) Judge: found students' behavior for checking methodology and collaborated in their group 3) Whole class discussion and comparison found only (3) Judge: Students' behavior for checking methodology and result of others group presentation and 4) Summarization through connecting students' mathematical ideas emerged in the classroom found only (3) Judge: Students' behavior for checking all how to solve problem and checking result together through students' word or writing with a teacher.

Keyword: *Mathematical problem solving ability, Open Approach and Lesson Study*

Introduction

The national education reformation required to improve the capacity of human resource and supported education having higher quality because it related to socioeconomic development. It also assisted country out of an underdeveloped country (Ministry of Education and sports, Lao PDR, 2008). The education reformation was the importance for teaching methodology adaptation. The new method emphasized on students as a student centered, encouraging analytic thinking, and skills in problem solving skills. These could be treated and practiced from Mathematics, the mathematics could be developed creative

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thinking and problem solving ability in learning and real life (Ministry of Education and sports, Lao PDR, 2013).

According to the annual report in 2015 of Demonstration primary school, Pakse Teacher Training College revealed information about learning and teaching Mathematics in the last period. The document described to learning and teaching Mathematics in the classroom. The teachers conducted their teaching as teacher centered rather than encouraging students' autonomy on thinking process, especially problem solving ability. As a result, students' solve problem was lower than expected and unable to reach the goals of an academic year (Demonstration primary school, Pakse TTC, Lao PDR, 2015). Although mathematical problem solving processes were explicitly defined in the curriculum but the school did not follow and practice. Mathematical Learning and teaching in the school in Thailand, teachers mostly depended on teaching materials from textbooks. They tended to follow content and activities in the textbooks such as rules application, formulation and giving examples to do homework. It could say that teaching mathematics likes talking about Mathematics and implied teaching expected only high scores in the examination. Almost class teachers applied the same methods and did not realize mathematical thinking process. Therefore, students were lack of analytic thinking as well as problem solving (Inprasitha et al, 2003).

The core curriculum, 2008, provided problem solving ability to be one of five competence of students. The students had competence in problem solving, having moral, knowledge acquisition and understanding society relationship changing. Students could apply it practically (Ministry of Education, 2008). The problem solving ability is a skill used in learning Mathematics. Students have to practice and develop this skill be themselves because mathematical problem solving assisted to have enthusiasm, patience, widened perspective and effectively applied knowledge in real situations (Institute for the Promotion of Teaching Science and Technology, 2008). Chi and Glaster (1985) stated the mathematical task solving and reasoning are considered in relation to individual variation in cognitive proficiency. (Lither, 2010) the mentioned mathematical solving problem was a framework which derived from empirical data analysis. It created the opportunity for students to deal with the mathematical problem to reach the goals of learning mathematics. The components of mathematical problem solving ability comprised of 1) interpret, 2) Do and Use and 3) Judge.

Lesson study was innovation for teacher professional development that is widely used in Japan. The teacher worked as teamwork in learning and teaching dramatically and unhesitatingly. It was collaboration in teaching that brought experience integrating into creating lesson plan matching with students' knowledge (Yoshida, 2005). The lesson study has been adapted and employed in schools in Thailand since 2545, it employed to develop teacher profession which comprised of three flow steps 1) plan, 2) Do, 3) See (Inprasitha, 2010)

Open Approach stimulated students to solve problems by themselves and it supported thinking, creative development as well as autonomous mathematical problem solving ability (Nohda, 2000). The learning and teaching with Open Approach as teaching approach emphasized on the self-solving problem the teaching by open-approach method intends to open up the hearts of students toward mathematics. Open approach comprised of 4 steps: 1) Posing open-ended problem, 2) Students' self-learning, 3) Whole class discussion, 4) Summarization through connecting students' mathematical ideas emerged in the classroom. The four Open Approach above is integrated into lesson study (Inprasitha, 2010; 2011).

The Open Approach was introduced in Lao PDR since 2002. It was a training for mathematical and science teacher. The open approach project was held and disseminated by inviting science teachers to applied knowledge to participate in training. The aims were to

train them to know and apply the Open Approach in their school and improve educational quality in Lao PDR. The open approach project was under conducting of Assoc Prof Dr. Maitree Inprasitha. He has conducted a professional development program supported by the Ministry of Education, implementing two innovations – Lesson Study and Open Approach. He held an open approach lecturer in Faculty of Education, National University of Laos under HOSHINO PROJECT (Minsai Center, 2002). Assoc Prof Dr. Maitree Inprasitha is a Dean of Faculty of Education, Khon kaen University and a director of the institute for research and development in teaching profession for ASEAN. He and his team traveled and hold the practical training at Teacher Training College, Lao PDR in 2016. He lectured about lesson study and open approach for developing the higher order thinking mathematics. The training was for collegial teacher and nearby teaching in Pakse District. The trainees visited Khon kaen University for exchanging experiences and studied school context of Thailand and also cooperated as working network supported from Khon kaen University. And also an opportunity for teachers from Pakse Teacher Training College experiencing with Thai training process, encouraging the cooperation network and supporting from Khon kaen University (Pakse TTC, 2017). Therefore, the researcher would like to survey students' mathematical problem solving ability in Demonstration primary school, Pakse Teacher Training College, Lao PDR to guide for developing mathematical problem solving ability of the student.

Research purposes

To survey students' mathematical problem solving ability in the method of Open Approach at Demonstration primary school, Pakse Teacher Training College, Lao PDR

Terminology

1. Mathematical problem solving ability meant the behaviorism, thinking process or problem solving with the goals. The knowledge and experience application employed in mathematical problem solving to reach the goal setting (Lithner, 2010).

1) Interpret: meant problem understanding, content, materials, instruction, speaking, writing, listening and observation. It described the understanding of cognitive perception, method, instrument, and problem solving as goal setting.

2) Do and Use: meant knowledge and experience application to mathematical problem solving based on characteristic and type of problems. The appropriate concept, strategies, and method application deal with a type of problems.

3) Judge: meant concept investigation, working method and evaluating a result of problems. The conclusion reflected overall mathematical problem solving process, self-reflection on problem solving and other works.

2. Open Approach meant innovative teaching method applied in the first year of Demonstration primary school, Pakse Teacher Training College, Lao PDR. The innovative teaching methods emphasized on students' thinking development, answer acquisition strategies and encouraged them to have mathematical problem solving ability based on four steps of conceptual framework as follows:

1. Posing open-ended problem.
2. Students' self-learning.
3. Whole class discussion and comparison.
4. Summarization through connection students' mathematical ideas emerged in the classroom.

3. Lesson study meant teacher collaboration for making the lesson plan, creating Open-ended problems and concept expectation. It involved learning and teaching instruction, material preparation, and lesson plan translation into Lao. The last process was observation and reflection after study. There are 3 processes of lesson study according to Inprasitha

(2011); collaboratively design a research lesson, collaboratively observe the research lesson and collaboratively discuss and reflect the research lesson

Research methodology

1) Target group

The target group in this study was the first year of elementary school of Demonstration primary school, Pakse Teacher Training College, Lao PDR, in the second semester, the academic year 2016-2017. This study was purposive sampling. It divided into two groups of four people. The total number is 8 people.

2) Research tools

2.1) the data collection tools were; mathematics lesson plan, video recorder, sound recorder and camera and Semi-structured observation form.

2.2) the data analysis tools were; mathematical solving problem ability of students by frameworks of Lithner (2010), protocol video and sound data, Semi-structured observation form and students' works sheet.

3) Data analysis

The data analysis in this study was qualitative data analysis, protocol analysis, and descriptive analysis. The data obtained from semi-structured observation form, photos were taken, protocol sound and video recorder, writing tasks and observation of two groups. The data was analyzed to find out the behavior of students appeared in each process according to Open Approach of Inprasitha (2011) to related with the framework of mathematical problem solving ability of Lithner (2010).

Step 1: Posing open-ended problem:

1) Interpret.

Item 36	Teacher:	Read the instruction and then read together.
Item 37	Student:	Read instruction.
Item 38	Teacher:	Well done! Now listen to me again write Mathematics sentence and found the answer for this question. "How many cats more than dogs are there?" Do you know the answer?
Item 39	Student:	Understood

In item 36: Teacher read the sentence and then students read together. Students read by themselves and then teacher read the sentence again. Item 38: teacher said "Well done to his students. The teacher read the sentence and then the teacher told students to write symbol sentence and encourage students to find out the answer to the question was "How many cats more than dogs are there?". The teacher recommended students not to be afraid of mistakes and dirtiness that answer question as you knew". Item 39: students said, "Understood". This protocol analysis mean student had interpretation and understood instruction through observation and reading.

2) Do and Use: not found behavior of student about mathematical problem solving ability
3) Judge: not found behavior of student about mathematical problem solving ability

Step 2: Students' self-learning:

1) Interpret

Item 44	Diew:	Count it again how many
Item 45	Chanh:	Which ones were more?
Item 46	Saiyo:	Count it
Item 47	Chanh:	One two three four five six seven There were seven.

From this Episode, in item 44 Diew said: "Count it how many?" Item 45 chanh said "Which ones were more?" they were trying to figure out the number of animals. Chanh and his friend counted animal to find out exact numbers. Item 47 Chanh said, "One two three four five six seven" (counted with pen and point). The answer was "The dogs had seven." It meant they interpreted and understood by the collaborative solving problem in group discussion.

2) Do and Use

Item 58	Chanh:	The number of dogs were more than cats
Item 59	Diew:	Chanh write down! The dogs were more than cats
Item 60	Nouth:	Just moment, counted them again one two three four five six seven. Right!
Item 61	Chanh:	One two three four five The cats had five

In item 58 Chanh said, "The number of dogs was more than cats (two dogs)." Chanh posed his answer but his friend was not sure with the answer, they counted again. Item 40 Nouth said "Just moment! Let count them again for the correct answer, they counted one two three four five six and seven. It was the correct answer." It showed that students were collaborative in their group, they checked mutually answer.

3) Judge:

Item 67	Diew:	Crossed out two dogs and left five dogs equally.
Item 68	Chanh:	Put circle on them, left them five and five, and two and two
Item 69	Diew:	tried it one Circle one dog and one cat.

From this Episode, in item 67-item 69 students tried to put circles on dogs and cats to figure out an exact number. Item 68, Chanh said, "Let me circle it, five per five, was it correct?" We drew circles on a group of dog and a group of cat equally. The small circle for left two dogs, circle technique was a strategy they used to find out numbers.

From observation above, the researcher team can summarize "students tried to understand the instruction and interpreted in group discussion and counting to find out an exact number. And then drew the double lines and circles to check the total number of dogs and cats. They counted again when they were the unsure answer from their friend." The Open Approach in step 2 found that students had mathematics problem solving ability in all steps.

Step 3: Whole class discussion and comparison:

1) Interpret): not found behavior of student about mathematical problem solving ability
2) Do and Use): not found behavior of student about mathematical problem solving ability
3) Judge:

Item 95	Chanh:	There were equally five dogs and cats in big circles the rest was two dogs.
Item 96	Teacher:	How did draw on dogs and cats?
Item 97	Diew:	circled a pair of dogs and cats There were two dogs. No pairs
Item 98	Teacher:	No Pair. What did it mean?
Item 99	Student:	Looked for pairs of dogs and cats.

From Item 95 chanh said, "There were equally five dogs and cats in big circles." Item 97 Diew said "Circled pairs of dogs and cats, it left two dogs" this was the discussion of their group, they learned and tried to look for correct and answer. Item 99 students said "there were two dogs left, so the number of dogs was more than cats." it meant that students had collaboration and discussion to find out an exact number of dogs and cats.

Form student observation above found "The problem solving from each group, they tried to find and compare answer within their group, observed its difference and number." It concluded they checked and found out the answer in step 2. They compared the answer with others group when they found answers.

Step 4: Summarization through connection students' mathematical ideas emerged in the classroom.

1) Interpret: did not find behavior of student about mathematical problem solving ability
2) Do and Use: did not find behavior of student about mathematical problem solving ability
3) Judge:

Item 105	Teacher:	Today we used circle symbol to look for exact number of dogs and cats. Did we have others techniques to find out the number?
Item 106	Student:	Deduction technique.
Item 107	Diew:	Drew circles equally with the number.
Item 108	Student:	Circled a pair of them
Item 109	Teacher:	How did we do with sentence symbol? Looked what we did in the past.
Item 110	Chanh:	Counted total number was seven.
Item 111	Teacher:	Why did we count total number seven?
Item 112	Chanh:	Because seven was more than five.
Item 113	Saiyo:	the seven deducted with five equal two
Item 114	Teacher:	What did the left number?
Item 115	Student:	It meant dogs more than cats were two
Item 116	Student:	We could to two ways to find out the answer correctly.

From this episode in item 105, teacher said "Today we used circle symbol to look for exact number of dogs and cats. Did we have others techniques to find out the number?" it

opened opportunities for students summed up the answer. Item 106, student said "used deduction technique". Item 107 said "Drew circles equally with the number" and item 108, student said "Circled a pair of them". Students repeated what they had done in speech. Item 110 Chanh said "count total number first." And item 122 Chanh said "Seven was more than five, it could deduct seven and five." It was symbol sentence investigation. Item 155 students said "It meant dogs more than cats were two" and item 166 Chanh said "We could to two ways to find out the answer correctly." It meant students investigated result and collaborated within their group comparing the answer.

From the perspective of researcher team observed in learning process in the classroom, Students collaborated with teacher when they assigned to do activities in the classroom. It could be summarized that students tried to found the answer and used sentence symbol to figure out exact number of animal. The Open Approach in step 2 found students investigated their answer between teacher and students.

Conclusion

When considered of each steps through Open Approach found students' behaviors occurred in different levels Inprasitha (2011). When overall consideration of all steps in learning and teaching employed Open Approach, it found behavior toward mathematical problem solving ability of students happened to all steps Lithner (2010).

Table 1: The result of students' mathematical solving problem ability with Open Approach

Open Approach	Interpret	Do and Use	Judge	Note
1) Posing open-ended problem	✓	✗	✗	
2) Students' self-learning	✓	✓	✓	
3) Whole class discussion and comparison	✗	✗	✓	
4) Summarization through connection students' mathematical ideas emerged in the classroom.	✗	✗	✓	

Discussion

1. The students' mathematical problem solving ability in step 1) Interpret meant the understanding of mathematical problem situations, attempting to understand parts of problems, considering appropriate instrument employment and setting goal to deal with problem respectively. The problem solving with Open Approach mostly found in step 1. It described to posing open ended problem situation led students to mathematical problem solving in the classroom. This was a conduit to bring students to problem interpretation and depth understanding how to deal with it. According to Inprasitha (2011), stated posing open ended problem situation affected to multifaceted thinking. The problems caused curiosity for students when they did not know how to solve it before. Moreover, teacher posed problems to students in a simple way when he conducted teaching.

2. The students' mathematical problem solving ability in step 2: Do and Use.

The Do and Use meant students' experience and prior knowledge used in problem solving. It found only step 2 in this study. It meant students faced problems and learnt to solve it by themselves. According to Lithner (2010), stated students employed mathematical knowledge to problems solving when they participated in mathematical problem situations. They

appropriately adapted multifaceted problem solving. Moreover, they employed the techniques and experience to deal with problems as well.

3. The students' mathematical problem solving ability in step 3: Judge.

The judge meant investigation from problematic solution. It also reflected to mathematical problem solving process and self-reflection and this behavior mainly occurred in step 2, 3 and 4 in Open Approach. According to Polya (1945 cited in Maitree Inprasitha, 2014), stated step 4: (Looking back) identified to creative and elaborated working process because it investigated thinking, steps of working applied in process.

The Open approach was an educational innovation for learners through problem solution. Therefore, teaching and learning improvement need to employ appropriate instrument and innovation (Maitree Inprasitha, 2003). The mathematical learning and teaching with Open Approach, it encouraged students' competence demonstration dealing with problem solving. Learning and teaching through Open approach supported practical activities and mathematical solving problems. Students were autonomous in learning (Nohda, 2000). The Open approach was a teaching approach emphasized self-autonomous learning and student-centered. Students learnt to try to solve problems by themselves. It supported students' learning because it had explicit steps and process (Inprasitha, 2010; 2011). As a result, the Open Approach was an instrument to raise education standard on mathematical problem solving ability of students in the classroom in Lao PDR.

Recommendations

1. Teachers have to encourage students to take note while they are learning in the classroom. It is a portfolio and useful for apply to problem solving in other situation.
2. Teachers have to have knowledge for open ended situation creation and knowing their roles in teaching and taking responsibility of supporting students.

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7th Grade Teachers' Mathematical Structures by Using Lesson Study and Open Approach

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Abstract

The purpose of this study is to explore Mathematical Structures of 7th Grade Teachers who using lesson study and open approach (Inprasitha,2011). This study was the qualitative research that emphasized on protocol analysis and analytical description. The focus group was 7th grade teachers who are a lesson study team of Sarakhampittayakhom School , as a case study. The data were collected from two learning units (Positive and negative numbers, and algebraic expression) by using video recorder, audio tape recorder, images recorder and field note, and analyzed by using lesson study and open approach 's protocol (Plan, Do and See) (Inprasitha,2011), students' ideas(activity sheet) and lesson plans.

On the purpose of this study to explore Mathematical Structures of 7th Grade Teachers who using lesson study and open approach. 7th grade teacher who is a one of Lesson study team realized about mathematical structure in every step of Lesson study and Open Approach. Each step of lesson study and open approach, mathematical structures are forming since first lesson plan to last lesson plan. The first step of Lesson Study: designing lesson plan together, found that teacher use mathematical ideas of students from last lesson to be base for creating mathematical activity and they use students' mathematical ideas to predict students' idea as well. The second step: observing lesson plan (Do), students' mathematical ideas occurred when they solved problem by themselves. Teachers observed students' mathematical ideas and bring them to be content in next lesson plan, and also use it to reflect with others in the last step of lesson study. In each learning units have their own mathematical structures which depend on students' ideas. Knowing mathematical structures is significant to teachers to design lesson plan and suppose students' ideas effectively.

Keywords: *Mathematical Structures, Lesson Study and Open Approach*

Introduction

Mathematics is one of three literacy that be important to students because it showed that they have efficiency to maintain their lives when the world has change, students must to assess about mathematical literacy (The Institute for the Promotion of Teaching Science and Teaching Science and Technology(IPST),2015) According to international and national tests like TIMSS (The Trends in International Mathematics and Science Study), PISA (Programme for International Student Assessment), and O-Net (Ordinary National Education Test) found that the scores of Thai students about Mathematics section was ineffective and showed that students' mathematical learning abilities was declining (Suni Kainin, 2015). Due to the fact that teachers did not give opportunities to student think, as the old teaching method (Inprasitha,2003). This teaching method was emphasized on teachers because they told, explained and gave examples to students only and students listened, remembered and just used them (Piboon Sinlarat,2014)

As reported by Rung Keawdang (2010) stated that Mathematics teachers used their own experiences about teaching math from textbooks to students only, they wasn't interested in the

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idea of students and they did not know what their students know or did not know, and they focus on examination to make student get scored, but did not use them to improve mathematical learning of students. For this reason, teachers should change their teaching method (Suni Kainin,2015) The Ministry of Education of Thailand (2007) realized about this problem, they tried to reform education in Thailand for teaching and learning development in many times but it was wasteful, cause the significant thing to reform have to be teachers, they should be developed too. Charinee Triwarunu (2009) suggested that Thailand's improving in teaching and learning and teacher's development have to use innovation.

Maitree Inprasitha (2003) offered two innovations to improve and develop teaching and learning of Thai teachers, which are Lesson Study and Open Approach. History of Lesson Study and Open Approach came from Japan, Japanese teachers use Lesson Study as an innovation to work together to develop their lesson follow by the real situations in their classroom since early 19th century(Narumon Inprasitha, 2009). This innovation reflect on the most effectively way to improve and develop teaching and learning in classroom and valuable to develop teachers and their team as well (Lewis and Hurd,2011) As Thailand context, Lesson Study as innovation follow by 3 steps: Designing lesson plan together of lesson study team (Plan), observing lesson plan (Do) and discussing and reflecting lesson plan(See), and worked with another innovation is Open Approach. Open Approach as a teaching method in the second step of Lesson Study,), one of lesson study team as teacher use lesson plan in the real classroom by follow by 4 steps of Open Approach:1) Posing open-ended problem, 2) Students' self-learning, 3) Whole class discussion and comparison and 4) Summarization through connection students' mathematical ideas emerged in the classroom (Inprasitha, 2011).

Designing Lesson plan is important step in Lesson Study and Open Approach, which is members of Lesson Study team have to work together to design mathematical activity to support a various ideas of students in a classroom. Students' Mathematical ideas are important to design lesson plan in school mathematics as content (Inprasitha, 2017). LS team have to help together to predict students' ideas. How to predict students 'ideas? According to Shizumai Shimizu (2017), Mathematics teachers, who can predict students' ideas, have to know prior knowledge of their students, and know how to connect those knowledge to present and future knowledge.

Connecting prior, present and future knowledge is one of components in Mathematical Structures that teacher use in a classroom (Mason et al, 2009) Mark Thomas Gronow (2015) explained that mathematical structures is learning and teaching management that make students get their achievement by using mathematical content and concepts, and understand mathematics more deeply. Mathematical Structure as the base to form to be mathematical content (Jones and Bush, 1996). Teacher who didn't know about mathematical structures cannot plan or predict students 'mathematical ideas efficiently, affect to students' learning.
As the above reason, the researcher is interested to explore mathematical structures of teacher's grade 7th who are in lesson study team and use lesson study and open Approach
Therefore, mathematical structures are significant to design lesson plan and predict students' mathematical ideas as well.

Research purposes

The purpose of this study is to explore 7th grade teachers' Mathematical Structures who use lesson study and open approach.

Terminology

Mathematical Structures as mathematical ideas of students that teacher used to create every Lesson Plan and forming to be structures knowledge of that learning content.

Lesson Study as innovation which lesson study team (a researcher, assists researcher, 7th grade teacher , 8th grade teacher, expert teacher and teacher who are interested) of sarakhampittayakhom school to develop teaching and learning mathematics of teachers. Follow by 3 steps :

1) Designing lesson plan together (Plan), lesson plan team design mathematical activities follow by mathematical textbook which translate from Japanese languages to English.
2) Observing lesson plan (Do), a 7th grade teacher used lesson plan in a classroom by using open approach as teaching method, and other people observed.
3) Discussing and reflecting lesson plan (See), after using lesson plan in a classroom, lesson study team discus and reflect about these lesson plan and students 'ideas.

Open Approach as teaching method that give opportunities to students think and solve problem by themselves to e, with the situation or mathematical activity from mathematical textbook which translate from Japanese languages to English. There are 4 steps:

1) Posing open-end problems
2) Students think and solve problem by themselves
3) Whole group discussion and comparion
4) Conclusion by connecting students' mathematical ideas emerged in the classroom.

Research methodology

1) Focus group

In this study has focus group as teachers in lesson study team who was volunteer to be Lesson Study team, after getting a workshop of using mathematical textbook which translate from Japanese language to be English, and how to use Lesson Study and Open Approach as innovation in a class room by faculty of Education, Khonkean University. (Inprasitha, 2011)

2) Research tools

2.1 The data were collected from a learning units (Positive and negative numbers and algrabraric expression) by using lesson plan, video recorder, audio tape recorder, images recorder and field note

2.2 The data were analyzed by using lesson study and open approach's protocol (Plan, Do and See) (Inprasitha, 2011), students' ideas (activity sheet) and lesson plans.

3) Data collection

There are two learning units: Negative and positive numbers and algebraic expression This lesson study team came from teachers who are volunteer who is 7th grade teacher and other teacher who want to develop themselves, after they passed a workshop for using mathematical textbooks that translate from Japanese language to be English and how to use Lesson Study and open Approach as innovation in a classroom (Inprasitha,2011).
Researcher as a member of lesson study team to design ,plan and help other members in a team to design mathematical activity and situation at the first time, after other member can do by their own, The researcher, as observer in every step of Lesson Study and Open Approach

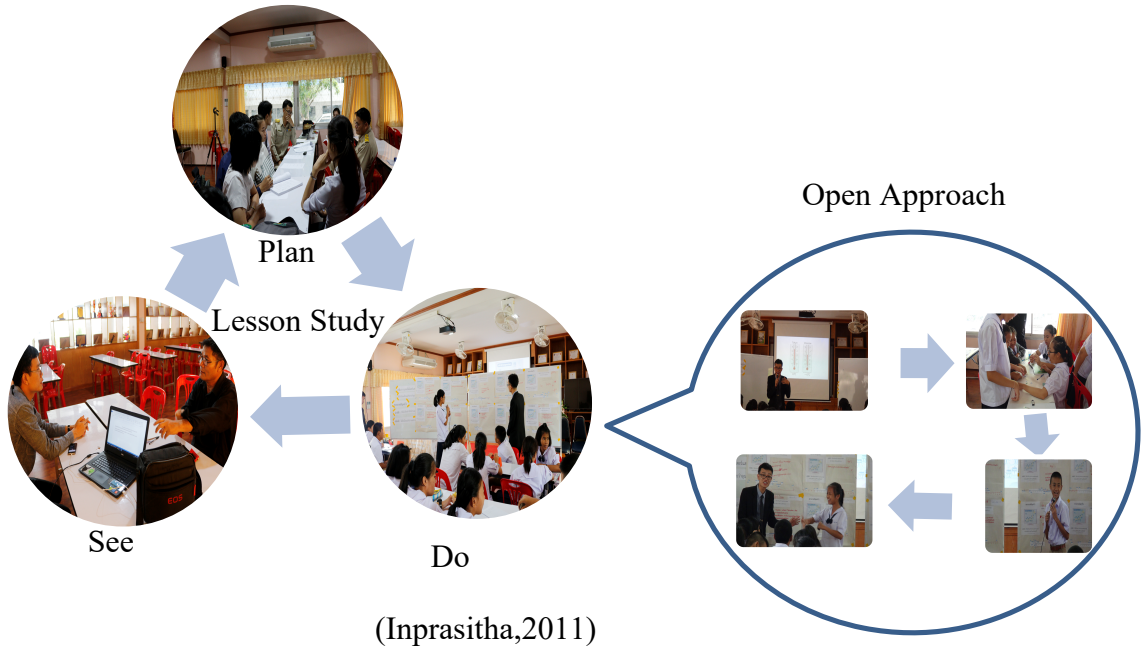
4) Data analysis

This study analyze the data by using lesson study and open approach as frameworks. The researcher analyzed the data from protocol of lesson student team in the first step of lesson study in every lesson plan, and from protocol in a second step of lesson study in class room of students and teachers to see the mathematical ideas of their students, and protocol from the last step to see how teacher reflect students' mathematical idea.

Conclusion

On the purpose of this study to explore Mathematical Structures of 7th Grade Teachers who using lesson study and open approach. 7th grade teacher who is a one of Lesson study team realized about mathematical structure in every step of Lesson study and Open Approach.

As the result, in each step of lesson study and open approach, mathematical structures are forming since first lesson plan to last lesson plan.



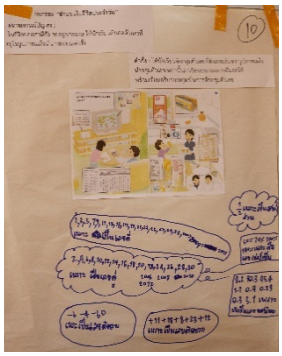
(Inprasitha,2011)

The first step of Lesson Study: designing lesson plan together, found that teacher use mathematical ideas of students from last lesson to be base for creating mathematical activity and they use students' mathematical ideas to predict students' idea as well.

The second step: observing lesson plan (Do), students' mathematical ideas occurred when they solved problem by themselves. Teachers observed students' mathematical ideas and bring them to be content in next lesson plan.

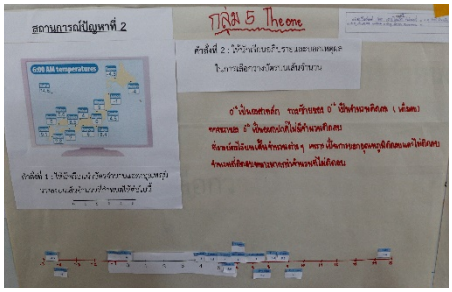
In a first learning units is negative and positive number, mathematical ideas of students used to be learning content. There are 17 lesson plans in the first learning units, teacher used students' ideas to base designing lesson plan.

For example,



First lesson plan is the number in daily life, the mathematical activity is used to let students show ability to separate the number in daily life to be many groups such as students divided their number by using characteristic of number which are negative number with the number that have negative sign in front of them such as -6 , -4 ,-6 and positive number is there are positive sign in front of them and also just number such as +11 ,+18,+8,+23,+12 and other group that we saw. This is one of mathematical ideas of students, teacher use them to create next lesson plan. After finishing the first lesson, lesson students team to ask reflect about their lesson plan.

From mathematical ideas of students, they know that negative number have the negative sign in front, then they have to know the meaning of them. Teacher plan to review the mathematical ideas from previous lesson, by using temperatures to relate pervious mathematical ideas to let students explain that



Student 1: "at red mark of Tokyo is over zero but in Mosco is above zero"

Student 2: "I see negative values of 6 , Tokyo is just 6 but Moscow is negative 6"

And students know the meaning of negative number with less than 0, after that next activity is how number place on number line. Teachers found that students can place number on number line from the smallest number to highest number and they can explain that "negative number have to place on the right hand side of zero"

Teachers keep the students 'ideas in very lesson plan, and it's forming mathematical Structures.

Discussion

In classroom use Lesson study and Open Approach as innovation, mathematical structures are formed by students 'mathematical ideas. Teachers should focus on students' mathematical ideas as much as possible, because they help teachers to create mathematical activities and make lesson plan effectively.

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A Study of English Reading Comprehension of Grade 4 Students by Using SQ4R Learning Model Together with Organize Notes Technique

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ABSTRACT

The objective of this research study was to examine the impact of the reading strategy SQ4R on student reading comprehension. The learning model is based on Francis' thought and targets student comprehension of text by breaking down the reading process into six steps: surveying, questioning, reading, and recording, reciting and reviewing. The goal was for the students to average a score 80% or higher on their final unit reading test. The second goal was for 80% of the class to pass. The target group was thirty-nine 4th grade students from the elementary Demonstration School of Khon Kaen University (Suksasart). This study took place during the second semester of the academic year 2016. The students used the 6 steps of SQ4R to find the main ideas rapidly and to gain a more full understanding of a difficult text easier.

Results:

Quantitatively: The students scored an average of 17.56 points, equivalent to 87.82% of the total score with standard deviation (S.D.) of 2.30. About 82.05% of the students passed the prescribed 80% passing criterion which was higher than the expected 80% of the total number.

Qualitative: The students really seemed to understand and comprehend all of the steps of SQ4R and they were able to adjust types of note taking such as T-chart, Webbing, KWL , Timeline , Venn Diagram , Boxes + Bullets to make wonderful notes. And also SQ4R helps students understand the text and deeper and with more confidence. Students enjoy it because they have more time and opportunities to connect with the text using creativity. Many students get very creative when creating notes, skits or games that help practice and demonstrate their knowledge. Students reading skills have increased during the time of practicing SQ4R.

Paper Instruction

1. Introduction

In the present global society, learning foreign languages is very important and essential to daily life, as foreign languages serve as an important tool for communication, education, seeking knowledge, livelihood and creating understanding of cultures and visions of the world community. Foreign languages enable learners to be aware of diversity of cultures and viewpoints in the world community, conducive to friendship and cooperation with various countries. They contribute to learners' development by giving learners better understanding of themselves and others. The learners are thus able to learn and understand differences of languages and cultures, customs and traditions, thinking, society, economy,

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politics and administration. They will be able to use foreign languages for communication as well as for easier and wider access to bodies of knowledge, and will have vision in leading their lives. (The Ministry of Education, 2008)

According to The Basic Education Core Curriculum, it has been heading to develop the learners based upon the Learners' Quality Study which will activate the learners 'competency especially the ability of thinking consisted of analysing, synthesizing and creating thinking. The critical thinking constructs knowledge and information for making self-decision and society in school to help improve Thai educational development including Thai goodness, intelligences and happiness in order to have high capacity and creation to join the world of competition by using learning processes to encourage the ability of reading, thinking and writing, providing the useful activities for the learners lifelong learning in everywhere. (Wiwattananon, Suwat, 2011) The important skill of organizing classroom activity is reading because it is a basically main skill in daily life. In particular, studying, communicating, using new technology are related to have English skill involved. Reading is a tool to receive information therefore teachers are important to plan and provide the activity for learners to be a good reader in Thai context. Reading skill plays a main role in daily life as it leads to get the several information and support the experiences and thinking skill. (Naharn, Dutsadee, 2010) Reading skill is a basic skill to engage knowledge and develop thinking skill particularly analysing, synthesizing and evaluating of the learners' self-realization that can lead to gain new knowledge in different fields as well as using English as a tool for studying.

According to the study of reading comprehension, it indicates that using SQ4R technique is a method to emphasize the learners to understand reading effectively. It consists of six steps: Survey, Question, Read, Recite, Record and Review. (Francis, 1970) SQ4R which has been developed from SQ3R helps produce a good habit of reading effectively. The learners have a chance to learn about finding a main idea when reading text that they will understand and memorize what they have read. Moreover, they are able to guess the answer from questions in a test faster. SQ4R has become the classroom activity based on Metacognitive theory, the thought of language teaching. It is psychology of learning that means steps or methods which are successful when reading by using two processes of reading: reading while realizing and controlling. Teaching reading by using SQ4R supports the learners to construct their own knowledge because constructing knowledge helps find, select information and interpret what they are reading. SQ4R can recall the lost information when the learners are reading and review that information to complete the missing data. (Kreeram, Phatcha, 2012)

Moreover, Taking note in various forms such as Post it, Boxes and Bullets, Web, Venn Diagram, T-Chart etc. is in the recording process that will help students take notes in various ways. It stimulates the interested student. The recording of reading, including the content is so short, compact, full-featured, easy to read. Notes are things that all students should do. Also, students will benefit from making notes such as practicing the skills in catching key points, reviewing insights and truthfulness in full notes, ease of use when there is a limited time, such as reading reviews before entering the exam room. It is a tool to test the ability to remember details about the content. When reading a note, they can extend the body back to the original version as it was and there is a chance to refine the idiomatic, expressions that have no chance or time to do so when taking notes from the description.

In conclusion, the researchers have been interested to study SQ4R together with organize notes technique in order to find out and develop the ability of English reading skill of the grade 4 students from demonstration school of Khon Kaen University, primary level (Suksasart).

2. Purpose of Study:

The research aimed to study on students reading comprehension achievement of Grade 4 students by using SQ4R Learning model. The goal was for students to score at least 80% and the number of students passing the standard not less than 80%.

3. Research Methods:

This research is an experimental study with target group. The target group were 39 students from Demonstration School of Khon Kaen University in the second semester of 2016 academic year. The instrument of this study were 1) 5 Lesson Plans Of English reading skills Based On SQ4R Model with organize notes technique Grade 4 2) an achievement test. Mean, percentage, and effectiveness index were used to analyze the collected data.

4. Collecting data

This research was an experimental study using one group pretest - posttest designs. The researcher collected the data manually. The experimental facilities were Unit D classroom and LAB room Demonstration School of Khon Kaen University Elementary Education (Suksasart) collected the following information :

4.1 The researcher conducted the learning as follows.

Date / Time	Plan for Learning Activities
Thursday 9th February 2017	**Lesson Plan** 1 What's the matter with Anna ?
Tuesday 14th February 2017	**Lesson Plan** 2 Billy's trip to clinic
Thursday 16th February 2017	**Lesson Plan** 3 Bear's family
Tuesday 21st February 2017	**Lesson Plan** 4 What are germ ?
Wednesday 22nd February 2017	**Lesson Plan** 5 Are you tired ?

4.2 The researcher conducted a test using the English reading comprehension test on Thursday 23rd of February 2017 at 13.00 -14.40. Then the data was analyzed by statistical methods.

Passage 1 What's the matter with Anna ?
Feedback :
This was a great reintroduction to SQ4R because students were able to practice using their new vocabulary. The story was very was easy to understand and had many illustrations. Students remembered the steps of SQ4R and were able to think of great questions and take good notes.
Passage 2 Billy's trip to the clinic
Feedback :
Students made a timeline for the first time. A timeline is a form of note taking that record's a story's most important details in the order they happened in. The students really seemed to enjoy this method. However, it was clear students could use more help in making sure they were only recording the story's most important details and not just ever line of the story. We had the students add pictures to the events, so we knew they were truly understanding what they were reading and not just coping text from the story.
Passage 3 Bear's family
Feedback :
Students enjoyed reading about the Bear family and using their vocabulary about "should/ shouldn't" and illness. Students made a chart after reading with two columns, one for

"should" and one for "shouldn't." Students really showed a deeper understanding of the story. The chart making was a great way for us to check student understanding beyond the traditional quiz or test. Many students also added illustrations and creativity to their charts.

Passage 4 What are germs ?

Feedback :

Students tried using the a new form of note taking KWL. KWL is a three column note taking technique usually used for nonfiction. One column is "Know." This is column is used for students to write down everything they already know about the subject. The second column is "want to know," this is where students right down what they might want to know about a subject. The third column is "learned," after reading, students write down what they have learned. The students seemed to enjoy this technique and had a fun time learning something new.

Passage 5 Are you tired ?

Feedback :

The students were able to show they are comfortable and confident using SQ4R. They were able to do most of the steps independently and in partners. After they were done they answered questions about the passage with fluency and comprehension.

4. Finding:

The result were as follows : When using SQ4 R Learning model to study 4th grade students reading comprehension achievement the highest scores were 20 and the lowest scores were 12. The students scored an average of 17.56 points equalling 87.82% on English reading comprehension with standard deviation (S.D.) of 2.30. On the SQ4R assessment 32 out of 39 students passed equalling 82.05%. That means the students passed the prescribed 80% passing criterion which was higher than the expected 80% of the total number.

They were tested after learning the SQ4R strategy. Learning the SQ4R was beyond the expectations and criteria for this course. Based on the observation and evaluation of students, the Thai and foreign teachers found that students were using more critical thinking skills during and after the practice of SQ4R skills than prior to learning the strategy. The students also become more comfortable in multiple forms of note taking. They became skilled in asking questions and recording important details from the text. The students learned the metacognitive strategy through six steps. The first step is **Survey (S)**, students explore the story tentatively. The teacher guides the reader to quickly scan the reading text. The students discuss what they see in photos, title or the text that could help them make predictions to what the story will be about. The second step is **Question (Q)**, teachers help guide students to make questions about the text, until students are able to make questions on their own. The questions are based off what they would like to know about the text. The third step is **Read (R),** students read the text carefully, line by line. If the text is long, students can break the reading into digestible chunks. The fourth step is **Record (R),** student's record information from the reading in the third step. In this research, there are various types of annotations, such as T-chart, Webbing, KWL, Timeline, Venn Diagram, Boxes + Bullets. Students can choose organize notes technique to make notes more comprehensively. Students practice finding and recording the main ideas of the text and their key details by using various techniques. Students can record in pairs for peer support and brain storming. The fifth step is **Recite (R)**, the student summarizes their main idea and key details and other takeaways. Students can do this by sharing and comparing their notes and recordings with another partner group, peer or teacher .The sixth step is **Review (R)**, the student's time to make sure they comprehend the reading. The critical last step of the reading and last chance to make and/or hear final comments about the reading and/or mind maps. Sometimes the students' role play the main

events from the text in front of the class. Students can also create a song, picture, or present their recordings and findings to the class.

The reading strategy SQ4R supports the students in leading their own learning and comprehension with critical thinking. SQ4R helps students find and select key information from a text and interpret what they are reading. SQ4R helps highlight and recall information that could be lost or easily missed by just simply reading through a text with no strategy. From our data, after the SQ4R reading strategy was implemented, class participation increased, especially during the question and recall phases. Students were able to retain the information and really seemed to enjoy the learning process.

This research project was supported and inspired by the research of Ruttapun Lerdkhamfoo (2004), Sundhorn Uttamaharah (2004), Pornipa Banjongmanee (2005), Jiraporn Nhulai (2007), Somsamai Karlsun (2011), Supanee Sotho (2011) and Phumin Laoumnaj (2012)

The research based on the method of SQ4R showed that the achievement was higher than the criterion that was set for the students. The students showed enthusiasm about learning English and using the strategy. They were more confident in reading in English. Teachers should continue to encourage advancements in English reading, as well as other skills that promote self-teaching and critical thinking. The teachers believe that SQ4R can help develop those skills.

5. Suggestion

The researchers have some suggestions like

5.1 Make a poster / anchor chart or other visual aid to help students understand the steps of SQ4R

5.2 Practice more with partner sharing, small group work or centers. It is difficult to keep the whole class focused and engaged with only whole group teaching. Small groups and centers could help students engage and learn on a more personal level.

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Research Synthesis about Mathematical Learning Process in Lesson Study and Open Approach Context

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Abstract

The objectives of this study were: 1) to survey the research of Mathematics Education, Faculty of Education, Khon Kaen University during 2006 – 2015; 2) to synthesize research about mathematical learning process in the context of Lesson study and Open Approach by content analysis. The target group in this research is a thesis of master's degree or higher in the field of mathematics education, Faculty of Education, Khon Kaen University 2006 to 2015 from the electronic database of Khon Kaen University there are 130 researches and 74 of 130 was conducted in Lesson study and Open Approach context. Tools for this study included research study summary form and Interview form. The statistical analyses were percentage for the analysis of the characteristics of the research. Results were as follows**:** 1. The result from synthesis context in all research for classified research so this innovation can be divided into 3 phases: phase 1: Prove Open-ended problem, Open Approach Innovation used to develop lesson plan to create Open-ended situation so accordance with the research in 2006, 14 subjects accounted for 18.92%. Phase 2: The introduction of innovation into hold school system, The Open approach used in the development of professional teachers along with Lesson study innovation. There are three steps: including 1) Collaboratively design a research lesson by used Open Approach Innovation 2) Collaboratively observe the research lesson and 3) Collaboratively discuss and reflect on the research lesson situation so accordance with the research in 2007 to 2010, 28 subjects accounted for 37.84 %. And phase 3, the two innovation have step by steps. The open method is presented as a teaching method. There are four steps: 1) Posing Open-ended problems 2) Students' self-learning 3) Whole class discussion and comparison Whole class discussion and comparison 4) Summarization through connecting students' mathematical ideas emerged in the classroom and this innovation into the second step of lesson Study Compared with the research in 2011-2015, 32 subjects accounted for 43.24 %. Almost all research used qualitative research methodology focus of protocol analysis. 2.The result from content analysis as follows: In the classroom teaching using Open Approach and open-ended problems is a mathematical activity for students to solve problems, effect to student in develop mathematical learning processes because in the classroom, they have opportunity to participate in solving problems and to think freely, present their concept. And there is discussion and comparison those concepts for together with understanding. Though, the success of the classroom depends on many factors such as the role of the teacher, Student work role (eg. working alone or small group) etc.

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Keyword: *Lesson Study, Open Approach, Mathematical Learning Process, Research Synthesis*

Introduction

At present, educators are aware of the importance and necessity of mathematical learning in the field of mathematics and encouraging placement at all grade of mathematics curriculum in many countries such as Australia, Singapore and the United States, etc. (Institute for the Promotion of Teaching Science and Technology, 2007) National Council of Teachers of Mathematics (NCTM) has set the standard for school mathematics curriculum, consists of five topics: number and operation, geometry, algebra, data analysis and probability and five mathematical learning processes, including problem solving, communication, proof, and reasoning, representations and connection, etc. (National Council of Teachers of Mathematics (NCTM), 2000)

Thailand also attention to mathematical learning process as well and incorporating this concept into The Basic Education Core Curriculum in 2008, the mathematical learning process has defined as the knowledge of the learners. (Ministry of Education, 2001), but it is irregular that Thailand don't understand about "what is the process?" and contain the five process of learning into the sixth topic and linked with creative thinking, but it's not clear that this creativity is skill or ability (Inprasitha, 2014).

Faculty of Education Khonkaen University recognized importance of this part and tried to develop curriculum that focus problem solving and connected to other mathematical learning processes and created courses relate with the learning process in mathematics for connecting school mathematics with mathematics of university. Furthermore, this courses also development of student teacher to realize through learning and lead the model of teaching with a new innovation, it's not only change teaching methods, but also adept the paradigms of teacher and instructional development. This innovation is called "Lesson Study and Open Approach" (Inprasitha, 2014)

Both innovations have developed together. firstly, Lesson study as a way to improve teaching, it consists of three step for implementation: 1) Collaboratively design a research lesson 2) Collaboratively observe the research lesson 3) Collaboratively discuss and reflection the research lesson, and Open approach as a teaching method that focuses on problem solving and Individual Different, especially thinking process. There are four practical steps: 1) Posing Open-ended problems 2) Students' self-learning 3) Whole class discussion and comparison Whole class discussion and comparison 4) Summarization through connecting students' mathematical ideas emerged in the classroom. (Inprasitha, 2014)

Morever, in these innovations also uses open-ended problems to design "problem situation" so that support a lot of student's concept (Inprasitha, 2011) and the open-ended problem cause to a several of ideas and creative thinking (Hashimoto, 1997).

After innovations used in whole school so effect to develop students' learning process and self-directed learning through mathematical activities that change to teachers' instruction and students' learning together. Furthermore, the exchanges in classroom reduced classroom research of both students and teachers in field of mathematics education. For students in this field emphasize methods of acquiring knowledge from research and they can be researcher to practice, understanding and develop new knowledge by using research as a data base and leads to useful in the classroom. (Inprasitha, 2014) Likewise, also accordance with the Education Act 1999, section 24: Learning Management, clause 5: Research is part of the learning process. (Office of the Basic Education Commission,1999)

Currently, the researches in the context of Lesson Study and Open Approach, there are increasing every year and it's important to improve the quality of instruction. Provided the researches papers were collected and brought to study and analysis conclusion, it is benefit for teacher to adapt teaching and learning. The way to make for summary is "Research Synthesis" (Wirachai, 1999).

Research synthesis is approach to explore the facts of particular question through which two or more research studies are assessed with the objective of summarizing the evidence relating by statistical methods or content analysis so it's more extensive than individual research. (Wirachai, 1 9 9 9) Research synthesis has several of way such as quantitative research is use Meta-Analysis or qualitative research synthesis by Content Analysis (Poonsuwan, 2012). Content analysis is a widely used qualitative research technique so that interpretation and comparison of content, it is a highly flexible method and direct conclusions from the research (Hsieh & Shannon, 2005)

For this reason, researcher is aware importance of synthesis research about mathematical learning process in Lesson Study and open approach context of Mathematics Education, Faculty of Education Khon Kaen University during 2006 – 2015. The primary of analysis researches found that mainly research uses qualitative research. Thus, Researcher chose synthesis research by content analysis to provide a more detailed description of each research, analyzing the data and relate to the conclusions of all research that can be synthesized. In addition, the synthesis of research can be used develop mathematics classroom in both innovation context to more effectively. Also used as a way for the development of research to make progress.

Research purposes

This study was conducted to 1) survey the research of Mathematics Education, Faculty of Education, Khon Kaen University during 2006 – 2015 and to 2) synthesize research about mathematical learning process in the context of Lesson study and Open Approach by content analysis.

Terminology

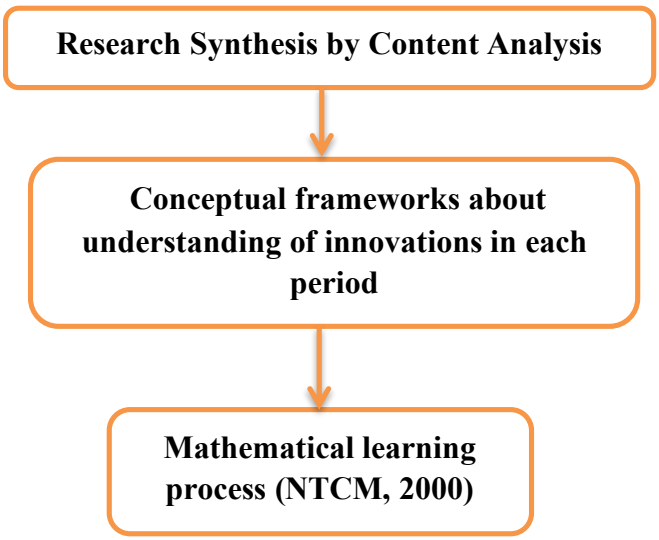
Research Synthesis means approach to explore the facts of particular question through which two or more research studies are assessed with the objective of summarizing the evidence relating by statistical methods or content analysis so it's more extensive than individual research. (Wirachai, 1999)

Content analysis means a widely used qualitative research technique so that interpretation and comparison of content, it is a highly flexible method and direct conclusions from the research (Hsieh & Shannon, 2005)

Mathematical learning process means a method to help students acquired knowledge in mathematics, which is essential for developing skills and abilities of learners. (NCTM, 2000)There are five processes, including problem solving, communication, proof and reasoning, representation and connection.

Lesson Study and Open approach means a guideline of practice for teaching professional development and enhancing students' mathematical thinking, which both innovations intergraded in Thai context. (Inprasitha, 2011)

Conceptual Framework



Research methodology

This research use content analysis for method, which there is details as following:

Step 1: Starting

The researcher defined the research issue as "What is the current general of research on mathematical learning in the context of Lesson Study and Open Approach?"

1. Review literature related to research synthesis, Lesson Study and Open Approach and mathematical learning process.
2. Bring the results of review literature create research framework.

Step 2: Choosing researches for synthesis

1. Survey research by searching information from the institutions' electronic database and selecting the thesis of master's degree or higher in the field of mathematics education, Faculty of Education, Khon Kaen University 2006 to 2015 and decide researches in context of Lesson Study and Open Approach. Next, Synthesis context of researches and interview teacher in mathematics education for divide understanding of innovations in each period.
2. The researcher selected the research on mathematical learning process based on the concept of NCTM (2000) with purposive sampling.

Step 3: Understanding the essence of the research

The researcher reads contents of the research and lead information into research study summary form.

Step 4: Data Analysis

The researcher analyze the data obtained from the research study summary form and analyze research groups with the same research issue, linking the similarly and different to present an overview of all research.

Step 5: Summary and Report

The researcher presents the result of summarizes research in tables form and analytical description.

Research tools

1. The research study summary form so adapt from Educational Research (1999) to record details of the research for synthesis research, it's divided into 4 past:

Part 1: Basic information: title, researcher, date of publication and type of research.

Part 2 : Detailed on research: the name of research area, grade of sampling, methodology and Population / sample

Part 3 : Information on data analysis includes data analysis. The data used in the analysis.

Part 4 : Details of results: Research on mathematical learning process, objectives, results, findings and research recommendations.

2. Interview form

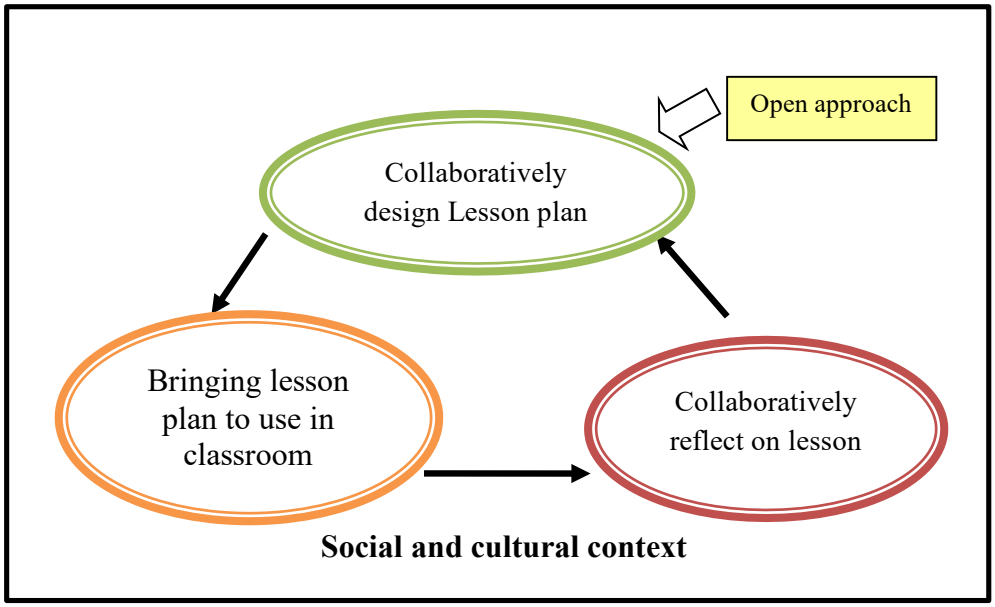
Conclusion

Past 1: the result of analysis context in research on Lesson study and Open approach it was found that so this innovation can be divided into 3 phases:

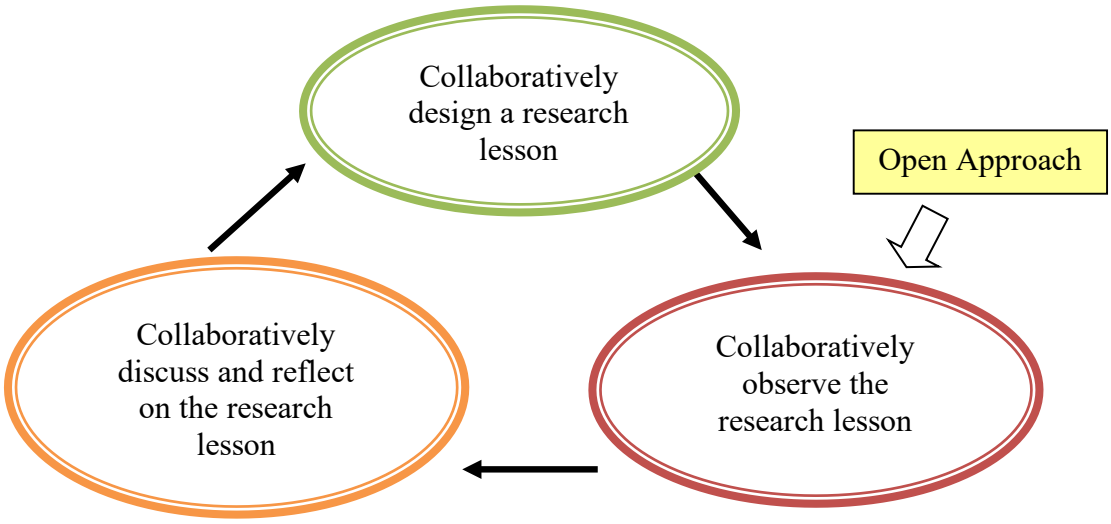
Phase 1: Prove Open-ended problem, Open Approach Innovation used to develop lesson plan to create Open-ended situation.

There is a process of creating open-end problems. While, bringing lesson plan to use in classroom, teachers observe student's learning process. After the ending of the teaching, they reflect together. But in this period isn't defined " Lesson study" . However, with the process that means "Lesson study".

Phase 2: The introduction of innovation into hold school system, the Open approach used in the development of professional teachers along with Lesson study innovation. There are three steps: including 1) Collaboratively design Lesson plan by used Open Approach Innovation 2) Bringing lesson plan to use in classroom and 3) Collaboratively reflect on lesson as a follow picture (Inprasitha, 2007)



Phase 3: The both innovation have step by steps. The open method is presented as a teaching method. There are four steps: 1) Posing Open-ended problems 2) Students' self-learning 3) Whole class discussion and comparison Whole class discussion and comparison 4) Summarization through connecting students' mathematical ideas emerged in the classroom as a follow: (Inprasitha,2010)

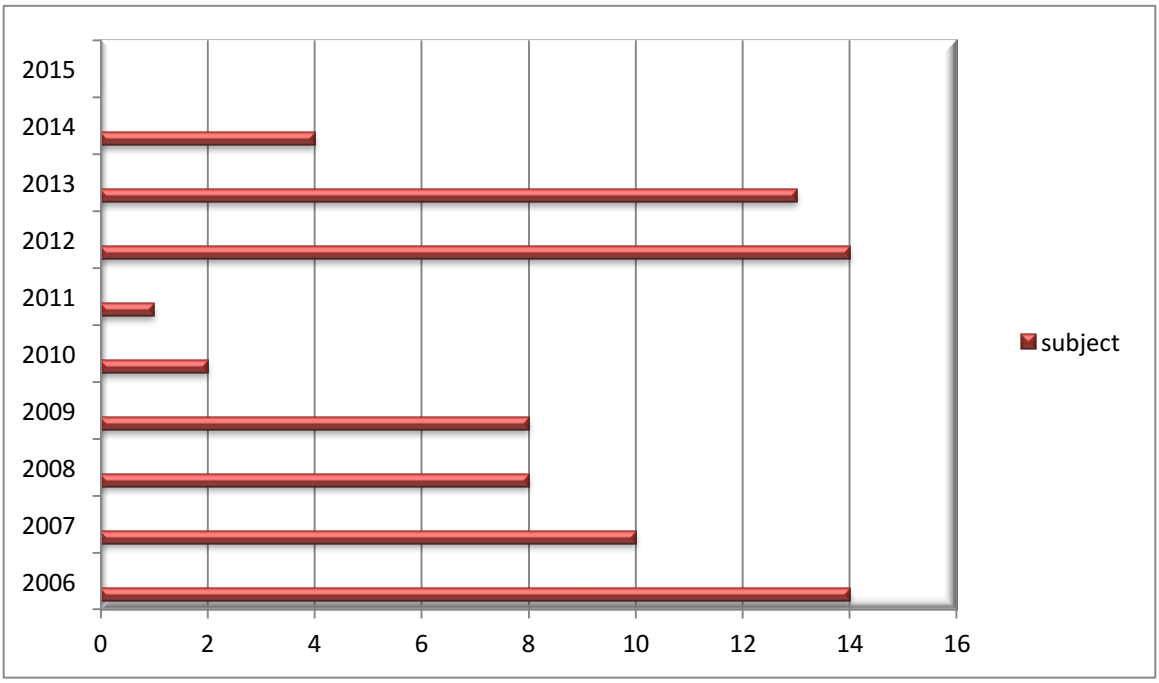


From the thesis survey of Mathematics Education has found 130 researches, there are 119 subjects of master degree accounted for 91.54% and 11 subject of doctoral degree accounted for 8.46 %. But study in the context of Lesson study and Open Approach has only 74 researches, there are 63 subjects of master degree and 11 subject of doctoral degree.

And from the three phase of innovation so accordance with the research as a follow table:

phase of innovation		**subject**	**percentage**
Phase 1	2006	14	18.92
Phase 2	2007 2008 2009 2010	10 8 8 2	37.84
Phase 3	2011 2012 2013 2014 2015	1 14 13 4 -	43.24
summation		74	100

These graphs show that amount of researches between 2006 and 2015 as a follow:



The most methodology of research used qualitative research focusing protocol analysis was transcription as written language. This data was used complementarity with information from field notes, interview form and other tools. Protocol analysis is method of data analysis generate by Schoenfeld (1985) to study people's thinking processes in a short time. He believed that when the people saying close to thinking at the moment. If you want to study people's thinking processes, then they have thought around. (Inprasitha, 2014) Moreover, some research has used protocol analysis from step 2 and 3 of Lesson Study in data analysis.

Furthermore, the papers using Lesson Study as a tool for collecting the data: create lesson plan by researchers, research assistants, and teachers in the research area to design open-ended situations. When bringing lesson plan to use in classroom, there was one teacher in the Lesson Study team, to use open approach as the teaching method that focus on students' problem solving by themselves, present their ideas and discuss together. The remaining members of the team observe student's learning process. After completion of the teaching, they reflect together and all researches followed the process of Lesson study. However, the indicator of the difference in research will depend on the research issue identified in each research.

Moreover, the results also show that the data for protocol analysis from field notes, the recorder and video recorder during problem solving. Including data from student's writings will help both researchers and teachers to see students' thinking processes in order to study the learning nature of their students and to encourage them to learn effectively in accordance with their potential.

Past 2: the result of synthesis research about Mathematical learning process by content analysis to found that:

In Lesson study context and using Open Approach is a teaching method. Furthermore, in class room also uses open-ended problem to create mathematical activity for students solve problems. In this way, it's affect to students' mathematical learning process because the open-ended situation opportunity to students' think freely and they has several of ideas. Especially the small group working, it's raise to sharing knowledge with other and improves mathematical communication. In step 1 of Open Approach, teacher tries to connect real world of students with situation using instructional concrete media such as block, picture et al. allow students have experience or move. It's can help students to find representation and new ideas to solve problems.

The open approach in Step 3 and 4, there is present concept and discussion together. Both steps cause to students' monitoring answers or how to solve them. Furthermore, students also will evaluate and value ideas and strategies that more effective, easier, and less time. These selected concepts and strategies will be stored as resources or knowledge that they will be used as the next learning tool.

Discussion

The difference of understanding innovations that effect to practice research. The thesis using Lesson Study as a tool for collecting the data: create lesson plan by researchers, research assistants, and teachers in the research area to design open-ended situations. When bringing lesson plan to use in classroom, there was one teacher in the Lesson Study team, to use open approach as the teaching method that focus on students' problem solving by them selves, present their ideas and discuss together. The remaining members of the team observe student's learning process. After completion of the teaching, they reflect together and all researches followed the process of Lesson study. However, the indicator of the difference in research will depend on the research issue identified in each research. Similarly, implement in school follow procedure of both innovations so there are teachers in each school as a Lesson Study team, collaboratively design Lesson plan, observe and reflection every week in school.

In this context, the students learned mathematics meaningfully though problem solving by themselves based on sharing mathematical ideas and develop mathematical learning processes in the classroom.

Acknowledgements

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The Development of Grade 7 Students with Deficiencies in Learning Mathematics on the Properties of Counting Numbers

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Abstract

The objective is to develop grade 7 students with deficiencies in learning mathematics on the properties of counting numbers. The research target group is 40 grade 7 students of the Demonstration School of Khon Kaen University Secondary Section (Mo din daeng), academic year 2016.The content used in the research is content from the grade 7 mathematics course in the learning unit on properties of counting numbers. The instrument used is a diagnostic test with a total of 4 questions which are divided into 2 sections; 1) 2 questions on finding the highest common factor, and 2) 2 questions on finding the lowest common multiple. Instruments used in the development contain 3 sets of exercises compiled of, 1) 4 questions on finding factors and common factors, 2) 4 questions on finding common multiples and 3) 4 questions on finding the highest common factor and lowest common multiple. Research results found that, there are a total of 13 students with deficiencies which equals to 32.5 %. Deficiencies from question 1: students with deficiencies have the most deficiency with multiplying 20 with 42 which equals 840, making 53.84 %. In question 2, students with deficiencies have the most deficiency in not answering, which is at 46.15 %. In question 3 have the most deficiency in multiplying 12 with 18 which equals 216, at 46.15 %. In question 4 have the most deficiency in not answering, at 46.15 %. According to the 4-questions exercise it was found that 13 students from a total of 40 students (32.5 %) needs to be developed in finding the highest common factor and lowest common multiple. The individual results of student development used 3 sets of exercises starting from easy numbers to difficult numbers with step-by-step explanations. Students answered all questions correctly at 75 %.

Keywords: *Deficiency, Learning Mathematics, Counting Numbers.*

Introduction

The National Education Act specified learning methods for school and other institutes involved in education to develop learner's thinking process that learners can practice thinking skill, management skill, problem solving skill, and applying those skills in real life from real situations. Therefore, learners can think and do it by themselves, prone to love reading, and demand to seek for knowledge constantly. Learning Management for Mathematics is one of the essential elements since Mathematic learning process is algorithm. Learner need to learn step by step for example, student could not understand how to multiply if they did not know how to add. Considering from student's exercise on the properties of counting numbers, revealed that students struggle on solving factor, factorization, Highest Common Divisor (H.C.D.), Lowest Common Multiple (L.C.M.), and cannot recognize multiplication table.

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Researchers studied failure on Mathematics and founded that most of research aims to study on objective diagnosis test by using failures from survey as misleading answers such as A Construction of the Mathematics Diagnostical test focusing on Logarithmic Function for Mathayom Suksa V (Suraphant Phantmanee, 1997), A construction of a mathematics diagnostic test focusing on decimal for Prathom Suksa VI students in Changwat Nakhon Ratchasima (Apinun Chaisorn, 1999). Others research studied by using failure on subjective test are as follows; A Mathematical diagnostic test on the Set to solve the Problems of Mathayom Suksa 4 (Poopan Ratanajak, 2001), A construction of an essay test to diagnose the problem - solving in mathematics on "Fraction" of Mathayom Suksa II students (Nathaporn Sriboon, 2000)

According to those studies, teachers faced problems on Mathematics instructions that students struggle on solving Mathematics problems and continuously did not know how to solve Mathematics problems affected to next lessons. Researchers founded that there are problems on instruction activities in the first semester, class of 2016. Hence, researchers need to reduce failures of students by seeking learner's problem and building diagnosis test to find student's failure on the properties of counting numbers of Mathayom Suksa I, Demonstration school of Khon Kaen University Secondary Section (Modindaeng) and to develop student's thinking skill, which increasing instructional capabilities.

Objective

The purpose of this paper is to develop student's failure on properties of counting numbers of Mathayom Suksa I, 2nd semester, class of 2016.

Methodology

1. Target group

A target group of this study is 40 students of Mathayom Suksa I, 2nd semester, class of 2016, Demonstration school of Khon Kaen University Secondary Section (Modindaeng)

2. Research instruments

2.1 Mathematical Diagnosis test on the properties of counting numbers of Mathayom Suksa I with four questions included;
- (a) Two questions of Highest Common Divisor (H.C.D.)
- (b) Two questions of Lowest Common Multiple (L.C.M.)

2.2 Three sets of exercise included;
- (a) Four questions of common factor and factorization
- (b) Four questions of common multiple
- (c) Four questions of Greatest Common Divisor and Least Common Multiple

2.3 Observation form

3. Data collection

Step of collecting data are as follows;

3.1 Preparing the Mathematical Diagnosis test on the properties of counting numbers

3.2 Using the Mathematical Diagnosis test on the properties of counting numbers with sample group, seeking failures, and analyzing student for development

3.3 Collecting data since December 2016 by researchers

4. Data analysis

4.1 Content validity by using **IOC: Index of Item-Objective Congruence** of Rovinelli and Hambleton (*Booncherd* Anuntapong, 1984)

$$IOC = \frac{\sum R}{N}$$

IOC = **Index of Item-Objective Congruence**
$\sum R$ = Total score of specialist opinion
N = Number of specialist

4.2 Analytic statistic: percentage

4.3 Analyzing data by frequency and percentage

$$\frac{\text{The number of failure frequent}}{\text{Total number of failure frequent}} \times 100$$

Results

1. Student's failure on the Mathematical Diagnosis test on the properties of counting numbers from 40 students categorized by student who fail and success as shown in table 1

Table 1 Number of failure students

Result	Number and percentage of sample group				Total	
	Male		Female			
	Number	Percentage	Number	Percentage	Number	Percentage
Failure student	14	35	13	32.5	27	67.5
Success student	11	27.5	2	5	13	32.5
Total	25	62.5	15	37.5	40	100.00

According from table 1, 13 students showed failure on the Mathematical Diagnosis test on the properties of counting numbers, which found duplicates failure as in table 2

Table 2 Student's failure on the first question

Question	Failure on the Mathematical Diagnosis test	Number of student	Percentage
1	1. 20 x 42 = 840	7	53.84
	2. Not answer	4	30.76
	3. Common factor are 1 and 2	2	15.40

Data in table 2 showed failure on the Mathematical Diagnosis test on the properties of counting numbers. According to question 1, 53.84% of students did 20x42=840, 30.76% not answer the question, and 15.40% could not figure out to common factor.

Table 3 Student's failure on the second question

Question	Failure on the Mathematical Diagnosis test	Number of student	Percentage
2	1. Not answer	6	46.15
	2. 15 x 36 = 540	5	38.47
	3. Answer 3	1	7.69
	4. Highest common factor were 15 and 36	1	7.69

Table 3 showed Student's failure on the second question, 46.15% of student were not answer this question, 38.47% did 15x36=540, 7.69% answered 3, and another 7.69% found the highest common factor as 15 and 36.

Table 4 Student's failure on the third question

Question	Failure on the Mathematical Diagnosis test	Number of student	Percentage
3	1. 12 x 18 = 216	6	46.15
	2. Not answer	3	23.07
	3. Answer 2	2	15.40
	4. Answer 3	1	7.69
	5. Answer 5	1	7.69

Table 4 showed student's failure on the third question, 46.15% did 12 x 18 = 216, 23.07% were not answer, 15.40% answered 2, 7.69% answered 3, and the rest 7.69% answered 5.

Table 5 Student's failure on the forth question

Question	Failure on the Mathematical Diagnosis test	Number of student	Percentage
4	1. Not answer	6	46.15
	2. 15 x 36 = 540	4	30.76
	3. Answer 3	2	15.40
	4. Highest common factor were 15 and 36	1	7.69

Table 5 showed Student's failure on the second question, 46.15% of student were not answer this question, 38.47% did 15x36=540, 7.69% answered 3, and another 7.69% found the highest common factor as 15 and 36.

According to failure on the Mathematical Diagnosis test, 32.50% of students need to be developed Mathematics skills on highest and lowest common factors. Teacher made an appointment with 13 students to practice after class. There were 6 students absent since their parents need them to take an extra class outside school, hence, 7 students taught by teacher at school after class which the student individual result of development showed as follow;

2. Individual result by using sets of exercise

The individual results after using 3 sets of exercise to student who fail on the properties of counting numbers are as follows;

Set 1 Factor and common factor (4 questions)

Student 1: All correct
Student 2: All correct
Student 3: 3 correct, 1 wrong (Question 1: division)
Student 4: All correct
Student 5: 3 correct, 1 wrong (Question 3: division)
Student 6: 3 correct, 1 wrong (Question 4: division)
Student 7: 3 correct, 1 wrong (Question 4: division)

There were 75% of students who can resolve problems correctly from total number of 7 students.

Set 2 Common multiple (4 questions)

Student 1: All correct
Student 2: All correct
Student 3: 3 correct, 1 wrong (Question 3: division)
Student 4: All correct
Student 5: 3 correct, 1 wrong (Question 3: division)
Student 6: 3 correct, 1 wrong (Question 3: division)
Student 7: 3 correct, 1 wrong (Question 4: division)

There were 75% of students who can resolve problems correctly from total number of 7 students.

Set 3 Highest Common Divisor and Lowest Common Multiple (4 questions)

After students did 2 sets of exercise, the last one is for reviewing and there is no example in set 3. Students need to do by their experience from the previous exercises.

Student 1: All correct
Student 2: All correct
Student 3: 3 correct, 1 wrong (Question 3: division)
Student 4: All correct
Student 5: 3 correct, 1 wrong (Question 3: division)
Student 6: 3 correct, 1 wrong (Question 4: division)
Student 7: 3 correct, 1 wrong (Question 4: division)

There were 75% of students who can resolve problems correctly from total number of 7 students.

Discussions

1. Failure categories from the Mathematical Diagnosis test on the properties of counting numbers (4 questions), can be summarized as in table 7;

Table 7 Failure categories from the Mathematical Diagnosis test on the properties of counting numbers

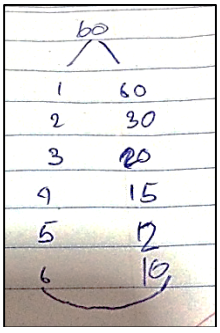
Failure	Failure categories
1. 20 x 42 = 840 15 x 36 = 540 12 x 18 = 216	Students were not realize of common factors, they saw numbers and resolve it promptly by multiple those numbers.

Failure	Failure categories
2. Not answer	Students do not have basic knowledge on this topic.
3. Highest Common Divisor of 15 and 36	Students wrote the highest common divisor but did not describe meaning
4. Common factors are 1 and 2	Students were not understand the meaning of common factors and highest common divisor
5. Lowest Common Multiple of 15 and 36	Students wrote the lowest common multiple but did not describe meaning
6. On question 2, students answered 3	Students were not understand question that need to answer the meaning not to resolve problem.
7. On question 3, students answered 2	Students were not understand how to figure out the highest common divisor
8. On question 3, students answered 3	Students were not understand how to figure out the highest common divisor
9. On question 3, students answered 5	Students were not understand how to figure out the highest common divisor by add divider together instead of multiply
10. On question 4, students answered 3	Students were not understand how to figure out the lowest common multiple

According to using the Mathematical Diagnosis test on the properties of counting numbers for Mathayom Suksa I, revealed student's failure as follows; common factor, highest common divisor, lowest common multiple, meaning of common factor, meaning of lowest common multiple. Researchers developed set of exercises for students to review after class step by step.

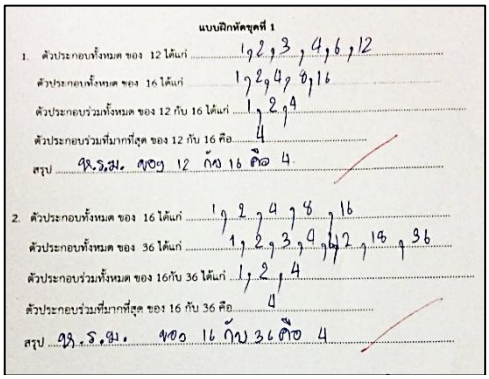
2. Failure student development

Students reviewed from set of exercises developed by teachers that student can study step by step and practice in the same time. Students were not intend to finish exercises if there are too difficult, in contrast, students would happy to resolve problems if questions are easy. Students who cannot complete all common factors, teacher will describe and show how to figure out as picture below.



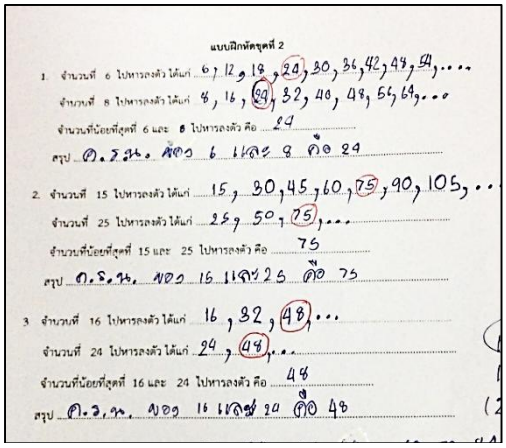
This method helps student think faster and found that student's ability on the properties of counting numbers were increased by using 3 sets of exercise as shown in pictures below.

Example of Set 1 exercise



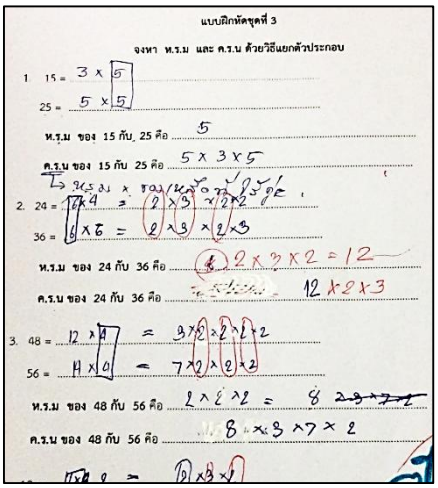
Example picture of the first student who can solve problems

Example of Set 2 exercise



Example picture of the first student who can solve problems

Example of Set 3 exercise



Example picture of the first student who can solve problems

3. Recommendation

This study revealed that in order to develop student's ability efficiently, students need to be willing to participate themselves. If teachers force them to participate, student ability would not develop. Teachers need to encourage students to practice continuously and try to solve more difficult problems, hence, student would solve problem by algorithm way.

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Mahasarakham Province. Master Thesis, Measurement and Evaluation. Khon Kaen: Graduate School, Khon Kaen University.

Developing STEM Learning Activities for Grade 12 Students Using Reviewing (R), Designing (D), Creating (C), Publishing (P) Chem-mation as a Constructionist Mindtool of Electrochemistry

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Abstract

The purposes of this study were to (1) develop STEM learning activities for Grade 12 students using RDCP Chem-mation as a constructionist mindtool on Electrochemistry to be efficiency standards 80/8, (2) study the effectiveness index using RDCP Chem-mation as a constructionist mindtool, (3) compare the achievements on Electrochemistry of students before and after learning with defined criteria, (4) compare before and after learning attitude towards Chemistry, and (5) study the creativity of students' Chem-mation tasks.

The methodology was classroom research; a sample of 38 Grade 12 students from Nhongnakam-wittayakom School who were in their second semester of 2016 (Cluster Sampling). Research instruments used were lesson plans, achievement tests, attitude tests, and creativity assessments. Data was analyzed using quantitative statistical methods such as percentage, average, standard deviation, and inferential statistics by t-test Dependent and Independent Samples.

Results found that (1) the efficiency of STEM learning activities using RDCP Chem-mation as a constructionist mindtool on Electrochemistry by the students was equal to 88.42/ 80.20, (2) the effectiveness index using RDCP Chem-mation as a constructionist mindtool was equal to 0.729, (3) the achievements on Electrochemistry of students after learning were higher than before learning using RDCP Chem-mation as a constructionist mindtool, and higher than defined criteria; level of statistical significance: .01, (4) the attitude of grade 12 students towards Chemistry after learning was higher than before learning using RDCP Chem-mation as a constructionist mindtool; level of statistical significance: .01, and (5) the students' Chem-mation tasks had excellent creativity.

Keywords: *STEM, RDCP Chem-mation, Constructionist Mindtool, Electrochemistry*

Introduction

The world is moving towards 22 century, but the learning management for the 21st century is a modern and popular thing to focus on right now. The article titled "Twenty-First Century Student Outcomes and Support Systems" to reflect that children in the 21st century, should have knowledge and skills needed, also the factors that could cause such learning, so it is up to the teachers to practice teaching reform in line with the new theory. (Partnership for 21st Century Skills**,** 2009) The economic and political challenges in the 21st century, skills of teachers and students in the subject should be integrated with the core subject knowledge on good citizenship, global awareness, financial knowledge, healthy knowledge, and environmental knowledge. The ability of teachers and students in the 21st century include the work ethic, professional working, problem solving, team working, using technology, creativity and innovation. (Pacific Policy Research Center, 2010)

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[2] *Principal of Mataneedol School, KhonKaen, Thailand*

Thus, researcher interested in developing learning achievement, attitude, and creativity of Grade 12 students using RDCP Chem-mation as a constructionist mindtool of Electrochemistry, which is the fourth step in the learning process to create the Chem-mation model are Reviewing (R), Designing (D), Creating (C), and Publishing (P) the Chem-mation to the website. The word "Chem-mation" combines the word "Chemistry" with "Animation" in this case means making simple Stop motion to explain or understand the concepts of students in chemistry by moving each objects of the characters or the background to look lively. To motivate student interest in learning, make things challenging, and causing higher-order thinking skills by integrating easily ICT with teaching and learning in the classroom together, which way to generate new ideas or new products. That causes positive attitude towards learning, promote the potential and new skills of students in the future.

Objectives of this research were…

1) To develop STEM learning activities for Grade 12 students using RDCP Chem-mation as a constructionist mindtool on Electrochemistry to be efficiency standards 80/80

2) To study the effectiveness index using RDCP Chem-mation as a constructionist mindtool

3) To compare the achievements on Electrochemistry of students before learning and after learning with defined criteria 70%

4) To compare before and after learning attitude towards Chemistry

5) To study the creativity of students' Chem-mation tasks

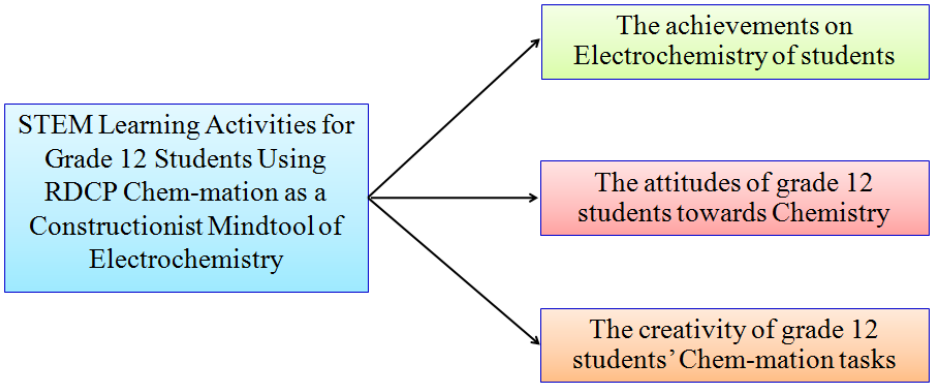

Figure 1 Research framework

Procedure

Research design

This research uses a One Group pre test – post test Design.

Population and sample

Population is Grade 12 students, studying Chemistry in the first semester of academic year 2016 from science and math program of Nhongnakam-wittayakom School has 73 students of two classes.

Sample is Grade 12 students, studying Chemistry in the first semester of academic year 2016 from science and math program of Nhongnakam-wittayakom School has 38 students of a class by using Cluster sampling, due to amount, gender, age, and academic achievement of students in each class, using classroom unit at random.

Instruments used in research

1) Lesson plans on Electrochemistry of Grade 12 students using RDCP Chem-mation as a constructionist mindtool for 32 hours, which is to review by experts and through the trial.

2) Achievement test is a test achievement on Electrochemistry of Grade 12 students, multiple-choice answer, 40 questions, which Index of Item - Objective Congruence (IOC) was more than 0.50 of all, difficulty index ranging from 0.33 to 0.78, discriminant index ranging from 0.23 to 0.64, and reliability of the test was 0.866.

3) Attitude test is a test attitude towards Chemistry using RDCP Chem-mation as a constructionist mindtool, characteristics of the test as Likert Scale, and five options. There are six components each with four questions included 24 questions, which the IOC was more than 0.50 for all items, discriminant index (t-test independent values) ranging from 1.96 to 5.11, and reliability was 0.878.

4) Assessment creativity as evaluation of the creative tasks of students (Chem-mation), characteristics of the test as a rating scale, four levels of rubric score, 7 components, which IOC was more than 0.50 for all items.

Data collection

1) Pre-testing achievement on Electrochemistry and attitude towards Chemistry using RDCP Chem-mation as a constructionist mindtool of Grade 12 students as samples, with test achievement and attitude test, researcher created.

2) Implementation of instructional activities in the classroom, according lesson plans on Electrochemistry of Grade 12 students as samples using RDCP Chem-mation as a constructionist mindtool for 32 hours.

3) During Implementation of learning management in classroom, based on lesson plans, then collect information from students during class exercises and evaluating creative Chem-mation's tasks of Grade 12 students as samples by assessment creativity, researcher developed.

4) After learning activities according lesson plans, post-test achievement on Electrochemistry and attitude towards Chemistry using RDCP Chem-mation as a constructionist mindtool of Grade 12 students as samples, with the test achievement and attitude test, researcher created and interviews more with students appropriate.

Data analysis

1) Analyzing the learning achievement of students.

- Study score level of students' learning achievement by using basic statistics includes percentage, mean, and standard deviation.
- Test average scores difference of students' learning achievement, between pre-test and post-test using t-test Dependent Samples.
- Test average scores difference of students' learning achievement, between post-test and criteria set using t-test Independent Samples.

2) Analyzing the creativity of students by using basic statistics includes percentage, mean, and standard deviation.

3) Analyzing the attitude towards Chemistry of students.

- Study score level of students' attitude towards Chemistry by using basic statistics includes percentage, mean, and standard deviation.
- Test average scores difference of students' attitude towards Chemistry, between pre-test and post-test using t-test Dependent Samples.

4) Determine the efficiency of learning activities using RDCP Chem-mation using RDCP Chem-mation as a constructionist mindtool on Electrochemistry of Grade 12 students by determining the efficiency value of process and the efficiency value of output (E_1/E_2).

5) Determine the Effectiveness Index (E.I.) of learning activities using RDCP Chem-mation as a constructionist mindtool on Electrochemistry of Grade 12 students.

Results

1) The efficiency of STEM learning activities using RDCP Chem-mation as a constructionist mindtool on Electrochemistry by the students was equal to 88.42/ 80.20.

2) The effectiveness index of using RDCP Chem-mation as a constructionist mindtool was equal to 0.729.

3) The achievements on Electrochemistry of students after learning were higher than before learning using RDCP Chem-mation as a constructionist mindtool, and higher than defined criteria; level of statistical significance: .01.

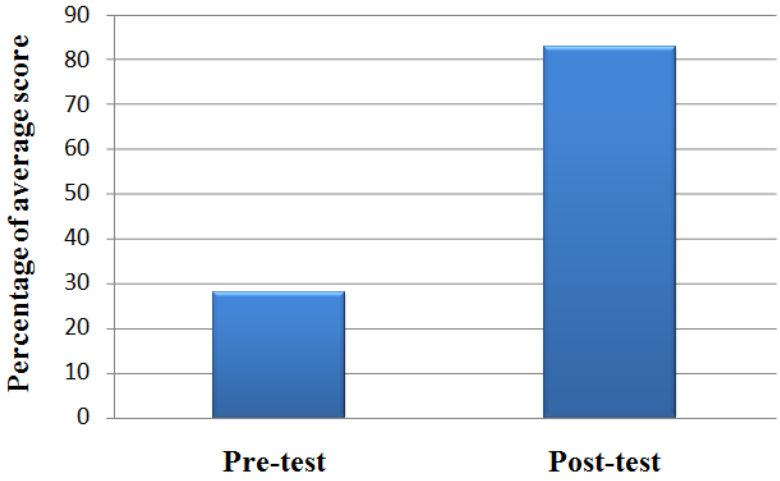

Figure 2 Students' score of learning achievements on Electrochemistry.

4) The attitudes of Grade 12 students towards Chemistry after learning was higher than before learning using RDCP Chem-mation as a constructionist mindtool; level of statistical significance: .01.

5) The creativity of Grade 12 students' Chem-mation tasks on Electrochemistry had excellent score.

Figure 3 The example of students' Chem-mation on the Galvanic cell.

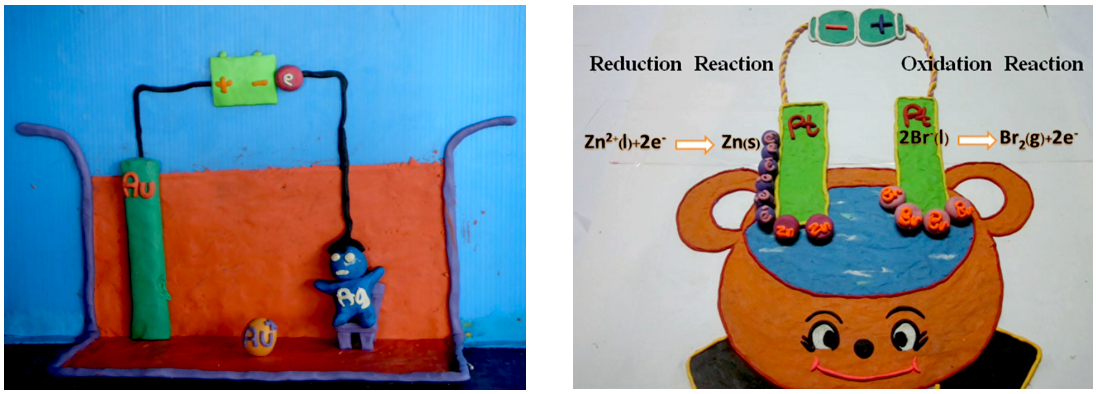

Figure 4 The example of students' Chem-mation on the Electrolytic cell.

Discussions

The results were so, because the researcher had used the approach to develop the quality of learners based on seven major reasons: (1) STEM education, by integrating skills and knowledge in Science, Technology, Engineering, and Math together. (Breiner, Harkness, Johnson & Koehler, 2012) (2) Active learning, as learning by supporting students to construct the knowledge of their own by doing, to students can think, plan, create, solve, and evaluate. (Wuttisak, 2009) (3) Constructivism theory, by providing students act activities to learn on their own or interacting with the external environment that are meaningful, link between new knowledge with old knowledge, then create up to new knowledge. (Fosnot, 2005) (4) Brain Based Learning (BBL), as learning activities that help promote learning of the brain, this is activities that promotes thinking process, promotes the functioning of the right cerebral hemisphere that has been developed in balanced and coordinated with the left cerebral hemisphere, for encourages students to be contributory factors to functions of the brain. (Jensen, 2005) (5) Analogy approach, by metaphoric concepts familiar or see on a daily with scientific concept, links between Analog and Target are the differences, the similarities, and unclear figuratively, this will help students better understand. (Harrison & Coll, 2008) (6) Learning in the 21st century, which require integrated in the teaching and learning by weaving or coordination with core knowledge, includes Learning and Innovation Skills, Information, Media and Technology Skills, and Life and Career Skills. (Partnership for 21st Century Skills, 2009) (7) Learning science according to the core curriculum for basic education, this aims to develop the students to be good people, intelligence, and happiness by focusing on the students' knowledge standard, there was important competencies, and have desirable characteristics. (Ministry of Education, 2008)

This is the seven key concepts has led to a framework for learning four stages: (1) R-Reviewing; students review content deeply by analyzing content and synthesis knowledge. (2) D-Designing; students have designed and planned systematically, to prepare before proceeding by analogy conception that students will use create to Chem-mation (Analog) with concepts that are studied (Target). (3) C-Creating; students practice for the creation of Chem-mation imagined by each group of students, which focuses on the work success by engaging in teamwork. (4) P-Publishing; students have to present Chem-mation to the class, and uploaded to YouTube or Facebook site to show their work to the publichas seemed, as a forum to share and learn from their work with other students and the challenges facing the students. Through integrating content on Electrochemistry with 5 steps learning process: (1) Review the contents and write script, (2) Design and drafting story board, (3) Sculpture, shifting and Photograph,

(4) Animate, (5) Present and public. These activities of such learning will affect the students to have the potential to jump over the several of the course, such as knowledge in the subject, attitudes or values, technology skills, thinking skills, social skills, communication skills, and other skills from the action. Which is raised learning to the next level to meet the challenges and solving problems of students, to prepare them to deal with the challenges of the 21st century. Including, every step of the learning process will be reflected or feedback and participatory assessment.

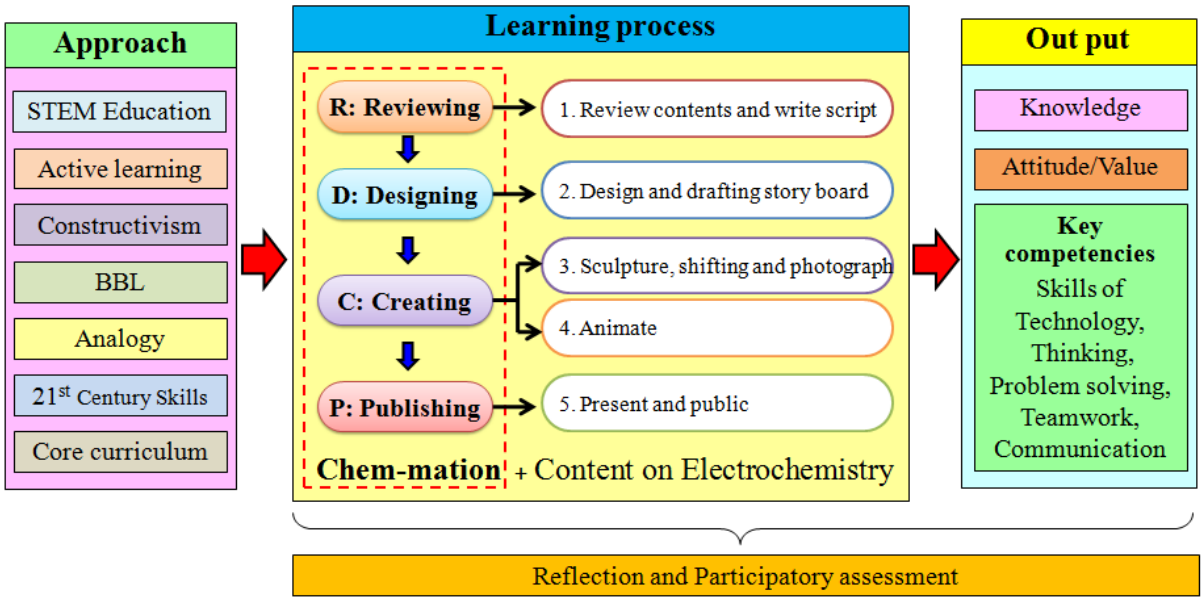

Figure 5 Conceptual framework to development of learners using RDCP Chem-mation as a constructionist mindtool.

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The Development of Handball Goal Shooting Skill for Grade 10 Students of Phimaiwittaya School using Medicine Ball Training Program

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ABSTRACT

The objectives of this research are (i) to create and find the efficiency of handball goal shooting skill program by using medicine ball to achieve the efficiency according to the standard criteria of 80/80 (ii) to compare between students' handball goal shooting skill before and after using training program by using medicine ball and (iii) to study the grade 10 students' satisfaction of handball goal shooting skill program by using medicine ball.

The samples were the 40-grade 10 students of room no. 1, Phimaiwittaya School, Phimai District, Nakhonratchasima in the 2nd Semester, 2015. The sampling students were simple random of 1 classes to practice were (i) the handball goal shooting skill program by using medicine ball, (ii) the handball goal shooting skill test and evaluation test of 20 items that the difficult-easy level, classification power and confidential level were 0.38-0.58, 0.22-0.69 and 0.86, respectively. (iii) The questionnaires of grade 10 students' satisfaction of handball goal shooting skill program by using medicine ball were the 10 items with scale of 5 levels. The statistics used to analyze data was the percentage, average, standard deviation and t-test hypothesis.

The research results show that (i) the efficiency of the handball goal shooting skill program by using medicine ball is 91.04/87.90 that is higher than criteria of 80/80. (ii) The grade 10 student' handball goal shooting skill by using medicine ball after using program is higher than that for before using this program with statistics significant level of 0.05. (iii) The grade 10 students' satisfaction of handball goal shooting skill program by using medicine ball is high (the average of 4.30 and standard deviation of 0.80). It indicates that they have the satisfaction of handball goal shooting skill program by using medicine ball.

Keyword: *The development of handball goal shooting skill*

1. Introduction

The importance of health and physical education in management of basic education curriculum program of 2008 state that health is the perfect human status in both of body, mind, social and mentality. The health is important because of relation to life that everybody should learn the health in the correct understanding and suitable attitude and value including health skills habit that give good quality (Academic Division, 2008). (I) Physical education subject is in the field of health and physical education. In the past, people often said that physical education is the only physical development because the activities in the field of physical education make visible only in specific areas. Nowadays, these ideas have changed because physical and mental must be related and consistent. Physical education is one aspect of an educational process that is not only focused on the physical development. But physical education has a goal: (I) To use these activities in everyday life, the physical education program is about helping learners to learn about physical education activities. Some of the styles used in everyday life are good experiences with health benefits. (II) Skills development is to improve the physical skills that learners need to be properly taught in a sequential order from the instructor. (III) Development of physical fitness Is organizing activities for students

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to achieve success with exercise and physical education is a way to lead healthy people. (IV) The environment in physical education activities helps learners to experience the development of skills in social and emotional. This experience has come from participating in events with friends, winning and losers in sports games. This experience is very important to the learner because of training people in social. (V) Development of knowledge in the areas of exercise and related knowledge to know the benefits of exercise. (Watsana Kuna-apisit, 1996)

To study physical education, the organization of the learning environment or the learning atmosphere is appropriate to make students happy and fun to study. Some teachers often argue that some students do not care to learn as they should. This may be that the teacher can not arrange the atmosphere for the students to be interested or satisfied. Therefore, the teaching and learning should start from (I) a matter of purpose, what will the students know? what they are learning? and what they will learn to do in the classroom? (II) course content, the content will be in the course itself. (III) learning activities (IV) the efficiency of the teacher (V) equipment and facilities and (VI) measurement and evaluation. They are all important to study physical education. (Worasak Pieanchop, 1994) Therefore, the teacher must find the appropriate way and process to manage the study to develop the learners' skills and learning achievement.

Handball is one of team sport that has a fast, exciting tempo. Nowadays, it is a sport both in the Olympic Games and Asian Games. This sport started with the gold medal in the 9th Asian Games from 19 November to 4 December 1982 in New Delhi, India to date. Both male and female handball teams of Thailand are not successful as it should be. One obvious cause is the lower physical fitness than that for the competing country. This type of sport requires athletes with high physical fitness because the competition is fast and continuous. (Sapunna Terarattanachai, 2006)

Both of men and women handball is a sport that is easy to learn and not too complex to play. The body composition is important, which requires the player to have strength, endurance, speed, agility, and the relationship between the nerves and muscles of the body. The body must have knowledge of skills such as movement of the foot (step) passing, dribbling and shooting. These skills need regular training to develop skills and the ability of the trainer.

Although, handball is a sport that will require team play. But it is time to shoot in order to win the team, it depends on your ability and strength. (Anek Koprae, 2004) Paiwan Tanlaput (1987) discusses the importance of shooting goals. Shooting is the most important skill to play that will lead to a win or lose result. Therefore, a player has a chance to score, he/she must score a goal. If you miss, it is an opportunity for the opposing team to score goals as consistent with research by Khajorn Trisopanakorn (2002) reported that teams to succeed must create a player capable of shooting. The trainer must be a special player for the goal. Training to score to be a great player must train the player strength and certainty in the pace of the goal. Training to strengthen muscles by weight to maximize current muscle performance is popular and very active in preparing the body of the athlete.

(Bob Richard, 1977, cited in Wisdom Thais, 2003), a very famous American athlete and also a champion at the 1948 Olympic Games. He used weight as a training aid. This makes him durable, movement speed, good neural and muscular coordination. Just like Mal Whitfields, the 800m hurdles champion in the two-time Olympics, found that training on track was as tolerant as ever coupled with weight training. It gives you a lot of strength and will practice only in the season. He will stop training when the desired race season. (Panya Munethaisong, 2003)

At present, weight training is a training scientific method that the principles and rationale are reliable. When the athlete or trainer has adopted them for training properly, they will make the athlete's physical fitness is high. This will result in more effective coaching. Weight training is available in a variety of styles such as barbells, swing bells, dumbbell and steel plates etc.

Medicine ball weight training is another weight training exercise that uses different weight weights to help strengthen the muscles of the limbs, to build up physical fitness and to nourish the nervous system, muscle work together and it is a device that suits the age of the learner. (Panya Munethaisong, 2003)

Medicine balls have the following exercises: (I) overhead throw, (II) backward throw, (III) power drop, (IV) pullover pass and (V) backward throw with jump to box. Training with this medicine ball is the upper body management. The trainer has developed several muscles: muscles, shoulders, upper arms, thighs, waist, belly, fingers, nerves and mobility. It can be seen that the training with medicine ball can develop both muscles and mobility. The study of Panya Munethaisong (2003) on the practice of mediocin ball training and basketball shooting practice found that pre-practice penalty shooting was more accurate after training at the significant level of 0.05. Furthermore, Vishuda Kongsut (2002) experimented with plyometrics of medicinal balls and rubber skin to the upper muscle power and speed of swim. She found that after 8 weeks of training, the experimental group had the plyometric training with medicine ball and rubber skin with upper muscle strength higher than the control group at the significance level of 0.05.

From above the background and importance of the skill training using the medicine ball, researchers are interested to develop handball shooting skills by using the medicine ball training program for grade 10 students in the Office of Nakhon Ratchasima Secondary Education Service Area 31.

The objectives of this research are: (i) to create and find the efficiency of handball goal shooting skill program by using medicine ball to achieve the efficiency according to the standard criteria of 80/80 (ii) to compare between students' handball goal shooting skill before and after using training program by using medicine ball and (iii) to study the grade 10 students' satisfaction of handball goal shooting skill program by using medicine ball.

2. Methodology

1. Population and samples

1.1 The population of this study is the grade 10 students who were studying in พ31202 Handball in Phimaiwittaya School, Phimai District, Nakhon Ratchasima Province, 80 students in the second semester of the academic year of 2015.

1.2 The samples in this study were 40 students in Grade 10 of room no. 1, Pimaiwittaya School, Phimai District, Nakhon Ratchasima Province, in the second semester of the academic year 2015. It came from a simple random sampling of two student classes by one lottery.

2. Variables

2.1 Independent variables: handball shooting skills training program with medicine balls.

2.2 Dependent variables:

1) The efficiency of training program with medicine balls,

2) The results of the goal shooting of a student's handball after the practice of shooting by using the medicine ball training program,

3) Student satisfaction to shooting skills training by using the medicine ball training program.

2.3 Research tools

1) Shooting practice program for handball by medicine ball

1.1) Standing shoot

1.2) Jumping shoot

1.3) Running and Jumping shoot

1.4) Jumping shoot from sides of the field

2) Handball skill examination and achievement examination with choice 20 question.

3) Satisfaction of shooting practice program for handball by medicine ball examination of grade 10 students with rating scale 5 levels, 10 questions.

2.4 Collecting data

Collecting data method of Shooting practice program for handball by medicine ball development.

2.4.1 Inform student about objective of Shooting practice program for handball by medicine ball development.

2.4.2 Students do the achievement examination

2.4.3 Proceed the Shooting practice program for handball by medicine ball development

2.4.4 Proceed Hand ball skill examination after finished the Shooting practice program for handball by medicine which has recording student behavior. In rubric scoring, there is a test which has 3 points, only student who gets 2 points above can pass the test.

2.4.5 Students do the education examination after training program.

2.4.6 Students do the Satisfaction of shooting practice program for handball by medicine ball examination.

2.5 Data analysis

Quantitative data come from Hand ball skill examination and achievement examination that is analyzed by percentage which has standard score at 80% and above. Comparing achievement examination score before and after training program by dependent t-test value and Satisfaction of shooting practice program for handball by medicine ball examination is analyzed by average (x) and standard deviation (S.D.)

3. Results and Discussions

Based on this research shooting practice program for handball by medicine ball for grade 10 student of Phimaiwittaya School, I discuss the findings as below:

1. Efficiency of training program by medicine ball is 91.04/87.90 which is greater than expectation of 80/80. because shooting practice program for handball by medicine ball is consistent with Komon Kamnerdhin (1995) who study about shot put training by medicine ball. Demonstrated group is student boy of Nong Mai Kaen Wittaya School which is 15 – 18 years old. They passed muscle test by shot put with medicine put for both one and two handed. We divided 45 students to be 3 groups or 15 students per group by randomized assignment to group. 1st group is normal training. 2nd group is medicine ball and 3rd group is heavy ball. Total training time is 12 weeks which 3 days per week. Performing the test between before and after then analyze by mean, standard deviation and one way analysis of variance if there is a different, 2 way analysis by TooKee A will be used. After 8th and 12th weeks. Shot put of 3 groups has stronger muscle at significant level of 0.05. when test by dual method found that medicine ball and heavy ball group don't have the different at level of 0.05. This is also consistent with Vitchuda kongsut (2002) who study "Plyometric training by

medicine ball and rubber which is influence to top muscle and speed in swimming of swimmer. Demonstrated group is undergraduate students of Chulalongkorn university of 2002. By specify 45 students, swimming test speed with arm only in 25 meters. The students is divided to be 3 group, 15 students per group. 1st group is only swimming. 2nd group is plyometric with medicine ball and swimming and 3rd group is plyometric with rubber and swimming. The trainings happen 3 days per week within 8 weeks. Record swimming test speed in every 2 weeks and the data is analyzed by mean standard deviation and variance analysis and comparing the result by Tukey a method. The result shows that after 8 weeks. The 1st group and 2nd group has stronger top muscle at significant level, 0.05. And 2nd group showed quicker speed than the 1st group after 4th weeks. Top muscle and speed of swimming by arm only in 25 meters of 1st and 2nd group has no significant level at 0.05.

2. Hand ball shooting skill by medicine ball shows a significant different at level, 0.05. Students have average score of 8.20, before training and students have average score of 17.58, after training. T-test is 3.382 that it a significant number in statistic at level 0.05. This may be because hand ball shooting skill development by medicine ball has standard efficiency of 80/80. When hand ball shooting skill development by medicine ball is used, students hand ball shooting skill is highly improved which is consistent with Anek Kophae (2004) who study "Result of Plyometric training of shoulder muscle, arm muscle and body muscle to hand ball shooting accuracy" in order to study about hand ball shooting accuracy. After Plyometric training of shoulder muscle, arm muscle and body muscle. Demonstrated group of physical education students of Chiang Rai institute who study hand ball course 20 students. By separate to be 2 group. There are non-plyometric training and plyometric training group. Based on the result, non-plyometric training group has hand ball shooting score is 4.60 before training and 4.90 after training that is not different. For plyometric training group, hand ball shooting score is 4.10 before training and 7.70 after training that is significant number in statistic (p 0.01). When training is completed for 6 weeks. Hand ball shooting accuracy of non-training group is 3.6 which is significant number is statistic (p 0.001). In additional, this is consistent with Panya Muenthaisong (2546) who study result of mentalism concentration and medicine ball for accuracy of basketball penalty shooting. 1st group do training with mentalism concentration for basketball penalty shooting. 2nd group do training with medicine ball for basketball penalty shooting and 3rd group do training with mentalism concentration and medicine ball for basketball penalty shooting which has basketball penalty shooting accuracy better than before penalty shooting training. Accuracy of penalty shooting basketball after training is significantly better in statistical at level of 0.05. 2) after 10 weeks training. 1st group do training with mentalism concentration is significant better than 2nd group do training with medicine ball and 4th group only basketball penalty shooting in statistic at level of 0.05.

3. Satisfaction of grade 10 students study to hand ball shooting skill development by medicine ball program. Average satisfaction of students is in high level, mean is 4.3 and standard deviation is 0.80. When consider assessment item of student that has highly satisfied because hand ball shooting skill development by medicine ball program is not too hard and not too easy. Training program is ordered by difficulty level to attract interest by short program for prevent tiresomeness that student can do hand ball shooting skill development. Student will be confident in training and satisfaction to hand ball shooting skill development by medicine ball program. This is consistent Westcott et al. who study "Resistance training normally and slowly speedy lifting". Demonstrated group is joined candidates who has never done resistance training, total 147 persons (56 Men and 82 Women). There are 2 cases, 1st study had 74 persons. Resistance training with normal speed (8 – 12 times per set, 7 second per times) for 39 persons. And resistance training with slowly speed (4-6 times per set, 14

second per times) for 35 persons. Training for 13 postures, 1 set per posture, by weighting 10 RM. Train 2-3 times per week, total 8 weeks. And test strength of 13 postures before and after training at 2nd week and 8th week by weighting 10 RM. 2nd study had 73 persons. Resistance training with normal speed (8 – 12 times per set, 7 second per times) for 43 persons. And resistance training with slowly speed (4-6 times per set, 14 seconds per times) for 30 persons. Training for 13 postures, 1 set per posture, by weighting 5RM. Train 2-3 times per week, total 10 weeks. And test strength for only chest press before and after training at 2nd week and 10th week by weighting 5 RM. The result show that both 2 case studys strength of men and women who did resistance training with slowly speed is significantly improved more than resistance training with normal speed. In case of 1st study, resistance training with slowly speed has lifted weight increased 12 kg. in average and resistance training with normal speed group is 8 kg. In case of 2nd study, resistance training with slowly speed has lifted weight increased 10.9 kg. in average and resistance training with normal speed group is 7.1 kg. Based on these 2 case studys, percent improvement of resistance training with normal speed is 25% and resistance training with slowly speed is 44%.

In summary, Hand ball shooting skill by medicine ball which is algorithm skilled formation program. Student can repeatedly train until expertise. Student can improve hand ball skill and can efficiently use this skill in daily life.

4. Conclusions

1. Efficiency of training program by medicine ball is 91.04/87.90 which is greater than expectation, 80/80.
2. Basic hand ball skill of grade 10 student of Phimaiwittaya School after training program is significant improved at level 0.05.
3. Satisfaction of shooting practice program for handball by medicine ball examination of grade 10 students has mean at 4.30 and standard deviation is 0.80 meaning that students highly stratifies the shooting practice program for handball by medicine ball.

5. Suggestions

Based on this research, hand ball shooting skill by medicine ball for grade 10 student of Phimai School, Phimai district, Nakorn Ratchasrima Province. I have suggestion as below.

1. Suggestion of research

1.1 in hand ball shooting skill development by medicine ball, teacher should recommend student to do additional training in free time.

1.2 in hand ball shooting skill development by medicine ball, teacher should closely take care student, develop student one by one to give correctly recommendation and improvement of student

1.3 Teacher should point out the fault and give a recommendation in poor skill of students. And have moral support when students have well done or show an improvement and better performing.

2. Suggestion for next research

2.1 shall study about technique hand ball athlete by training program with medicine ball. Thus, students will have a chance to develop hand ball skill.

2.2 shall use hand ball shooting skill development by medicine ball to test in other physical education especially the type of using arm with ball or throw ball because they use similar muscle.

6. Acknowledgments

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Enhancing Grade 11 Students' Scientific Explanation Using Inquiry 5E Cycle on Acid-Base Theory

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Abstract

This research focused on the study of scientific explanation abilities of grade 11 students by using the inquiry 5E cycle for inquiring knowledge regarding acid-based theory. The participants in this study were 26 students from grade 11 students in the second semester of academic year 2016 from Demonstration School of Khon Kaen University (Education) – Secondary school.

The tools used for collecting the data consisted of lesson plans and construction of scientific explanation tests. The statistics used in this study were average, percentage, and standard deviation (SD).The study found that the students who used inquiry5E cycle for inquiring knowledge regarding acid-based theory were able to construct the scientific explanation accounted for 71.97 percent. The value was higher than the set criteria, which was 70 percent. Therefore, it was considered to be at a well performance level. In addition, the capability of the students in constructing the scientific explanation after using the inquiry 5E cycle for inquiring knowledge regarding acid-base theory can be considered in a particular aspect. It was found that the highest average aspect of 13.19 was found in defending aspect, which was accounted for 87.95 percent. The first runner-up aspect was reasoning aspect which provided an average of 11.19 (accounted for 74.62 percent). The third one was evidence aspect with the lowest average of 8.00 (accounted for 53.33 percent). It could be concluded that the use of inquiry 5E cycle for inquiring knowledge is a quality model for teaching and learning. It can be implemented to develop the students' construction of explanations efficiently.

Keywords: *Construction of Scientific Explanation, inquiry , inquiry 5E cycle , Scientific Explanation*

Introduction

At the present day when communication has boundaries, scientific literacy is considered to be the basic knowledge for humans in order to response to the changing of cultures and the ways of human living in globalization. Scientific literacy helps humans adjust and explain the phenomenon that occur around us so thatscientific literacyis essential for the development of population. Followed by, the understandings of the scientific literacy that the learners should be able to express the knowledge to others. In this sense, the teachers evaluate the understandingsof the learners from the abilities in explaining. In other words, if the learners are able to explain the contents, it means that the learners understand the knowledge along with the contexts and technical terms. The current teaching and learning of scientific literacy aims to create the meaningful learning which has a variety of teaching plans for the teachers to adjust to their contexts. These practices can enhance the learners in various

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aspects and one of them is scientific literacy. It is the abilities of the learnersin scientific explanation which shows that the learners understand the knowledge. It is also the basic abilities and understandings of the scientific inquiry which includes [1] scientific explanation which is the abilities in answering specific points in scientific field. There are 3 important components used in explaining those specific points [2] : 1) Claim; is the synopsis of the answers to the scientific questions that aims to answer the question “How does it occur?” and “Why does it occur?” 2) Evidence; is the examination of the supporting information and 3) Reasoning; is the proof of the causes of the results with the evidences to support the claims. However, the essential factor of the learners’ scientific explanation is the right conceptual understanding. Since science if the knowledge that is based on cause and effect so the right conceptual understanding will help the learners interpret the situations. It is an individual understanding from prior knowledge, direct experiences, or from their learning that the learners use to relate to the new knowledge.

At present, scientific teaching and learning aims to create meaningful learning for the learners with various teaching plans and one of the most popular methods is inquiry learning. From the literature review and related studies, the researcher found that the use of inquiry 5E cycle for teaching and learning is another approach for inquiry learning which allows the learners to use scientific explanation. The group of the students from BSCS (Biological Science Curriculum Study) proposed the inquiry teaching and learning for scientific curriculum development. This method consists of 5 steps called Inquiry Cycle or 5Es including Engage, Explore, Explain, Elaborate, and Evaluate. The scopes of teaching and learning by using Inquiry Cycle are as follows, 1) Engagement aims to create interests of the learners 2) Exploration is exploring and researching 3) Explanation is explaining 4) Elaboration is an extension of the knowledge 5) Evaluation is evaluating. The scientists agree that these methods of teaching and learning emphasize the learning of scientific processes in order to make an understanding in natural phenomenon and also to communicate with others about what they have found. The outstanding characters of inquiry learning or self-learning by using the 5E Cycle are [3]: 1) the learners are interested in the arguable topics in scientific fields or what they are learning. 2) the learners orderly arrange and give significance to the evidences so as to relate them to the scientific points or prior questions. 3) the learners explain the points based on the found evidences and prior knowledge. 4) the learners relate the scientific explanation to the facts or the widely accepted scientific theories. 5) the learners evaluate the scientific explanation and also communicatewith others. In sum, these 5 outstanding characters of inquiry learning help the learners enhance their scientific explanation abilities.

Hence, the researcher has an interest in inquiry learning on acid-base theory which is one of the topics in Chemistry. The learners are to do the activities with the purpose of constructing the understandings in contents or the conceptual understandings. The activities shall facilitate the self-learning about scientific explanation of acid-base theory based on Constructivism which believes that the construction of knowledge by the learners will assist them in learning scientific knowledge and skills. Moreover, this approach will also create the life-long learning [4]. The scientific explanation of acid-base theory is relatively important for furthering the interpretation of the chemical reaction phenomenon such as complexometry reaction, proton transferring when reacting to the base, or the organic chemistry that reacts to nucleophile and electrophile [5]. The findings of this study can be used as an approach to enhance the learners’ knowledge and scientific explanation which shall also be beneficial for Chemistry subject.

Objective of the Study

This research aimed to study the scientific explanation abilities of the students from grade 11 in inquiring knowledge by using inquiry 5E cycle to learn about acid-base theory.

Definition of Terms

1. **Scientific Explanation** means the explanation or the report of the scientific phenomenon based on the scientific knowledge in order to relate the cause and effect of the phenomenon. The scientific explanation consists of3 important parts which are claim, evidence, and reasoning.These 3 components must correlate to one another.

2. **Inquiry Knowledge Teaching** means the process of problem-solving and finding the answers with the involvement of the learners**.** The learners are stimulated to relate the knowledge in solving the problems by answering the questions, experimenting, and observing.The teachers are only to provide sufficient resources for the learners' inquiry**,** suggest, and facilitate.

Methodology

The procedures in this research are as follows,

1. The participants in this study were 26 students from grade 11 studying in the second academic year 2016 from Demonstration School of KhonKaen University (Education) – Secondary school. The participants were selected by purposive sampling.
2. The variables for this study,
   2.1 Independent variable was the teaching plan using the inquiry 5E cycle about acid-base theory for the knowledge inquiry.
   2.2 Dependent variable was an ability of scientific explanation.
3. Place of the study was at the Demonstration School of KhonKaen University (Education) – Secondary school, AmphoeMuang, KhonKaen.
4. Design of the study was a one-group study with pre-test and post-test.
5. Tools used in the study could be divided into 2 types which were,
   5.1 Three teaching plans about acid-base theory for grade 11 students who were to study Science 32223 of Chemistry course using the textbooks provided by IPST (Institute for the Promotion of Teaching Science and Technology) which is the central primary curriculum (2008). The time for teaching was 6 hours.
   5.2 The scientific explanation tests about acid-base theory. The tests were multiple-choiceconsisted of situations, information for the given situations, and three questions based on the three components which were claim, evidence, and reasoning. The tests were designed to cover the contents learned about acid-base theory.

Data Collection

The researcher conducted the study following the developed teaching plans and collected the data in steps as follows,

1. Preparation
   The researcher introduced the course including the objectives of the course. Moreover, the researcher also suggested the teaching and learning methods for knowledge inquiry using the inquiry 5E cycle about acid-base theoryand the students' roles. Lastly, the researcher explained the meaning of scientific explanation to the students that it consisted of claim, evidence, and reasoning.
2. Research conduct
   The study followed the designed teaching plans for knowledge inquiry about acid-base theory using the inquiry 5E cycle. There were 3 teaching plans and each plan was assigned for a 2-hour teaching period. The total time for research conduct was 6 hours.
3. Data collection
   After learning, the data were collected from the scientific explanation assessmentsby the scientific explanation tests about acid-base theory. There were 3 questions for a 1-hour test time.

Data Analysis

1. The students' abilities in scientific explanation were analyzed by using the computer program for statistics which can be explained in more details as follows,
   1.1 The scores from the scientific explanation tests about acid-base theory were used to find the average of the frequency, the average of the scores ($\overline{X}$), and the Standard Deviation (S.D.) for comparing with the set evaluation criteria. In so doing, the result could be used to interpret the abilities of the students in scientific explanation.

Result and Conclusion

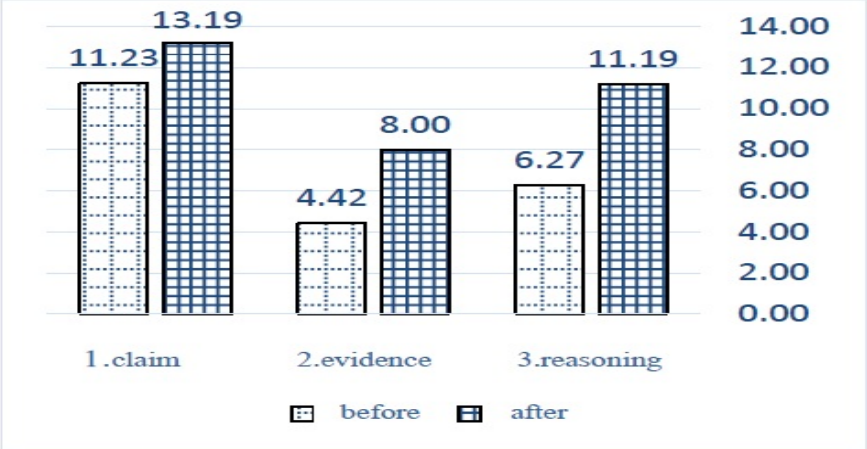
1. The students that used inquiry 5E cycle for inquiring knowledge about acid-based theory were able to construct the scientific explanation accounted for 71.97 percent. It was higher than the set criteria which was 70 percent as it was considered to be at a good level. The result is shown in Table 1.

Scientific explanation test	n	$\overline{X}$	S.D.	Percentage
Pre-test	26	21.92	5.10	48.72
Post-test	26	32.38	4.45	71.97

Table 1 The average, percentage, and Standard Deviation (S.D.) scores of the abilities in scientific explanation compared between pre-test and post-test.

2. The abilities of the students in constructing the scientific explanation after using the inquiry 5E cycle for inquiring knowledge about acid-base theory divided into aspects found that the highest average aspect was claim, which was 13.19 accounted for 87.95 percent.

Followed by reasoning which was 11.19 accounted for 74.62 percent, and the evidence had the lowest average which was 8.00 accounted for 53.33 percent as shown in the chart below.



The comparison of abilities scores in scientific explanation between pre-test and poet-test.

Discussion

1. The students that used inquiry 5E cycle for inquiring knowledge about acid-based theory were able to construct the scientific explanation accounted for 71.97 percent. It was higher than the set criteria which was 70 percent as it was considered to be at a good level. It can be explained that this type of learning allowed the students to practice writing the scientific explanation, including the presentation and evaluation of their own scientific explanations with the teacher and their peers. Since the students received the feedbacks during the evaluation period so they were able to adjust their explanation to be correct and complete. The use of inquiry 5E cycle for inquiring knowledge in teaching and learning can be used to replace the conventional teaching approaches such as the report writing of the experimental results. In addition, it can be used in tests for evaluating the knowledge of the students and their abilities in scientific inquiry. The scientific explanation reflects the processes, integration, and the communication of the knowledge in a form of claim or summary, then showing the evidence to prove the claim. Lastly, connect the found evidence and the claim to reasoning by using the scientific knowledge for understanding the phenomenon correctly and suitably to the explanation.[6] The teaching plans for the class are divided into 4 types which are 1) creating the prototype for explaining scientific knowledge. 2) creating messages and reasons for explaining scientific knowledge. 3) giving definitions of scientific explanation and 4) connecting scientific explanation to daily life routine explanations. The students inquired more of the scientific knowledge and explanation which correlates to the research. [7] the results of previous study revealed that teaching Chemistry by using prediction, observation, explanation, systematically enhanced the abilities of grade 10 students in making scientific explanation and reasoning which had an average score at a good level. It could be explained that the use of inquiry 5E cycle for inquiring knowledge is a quality model for teaching and learning. It can be implemented to develop the students' abilities in scientific explanation efficiently.

2. The result of this study found that the abilities of the students in constructing the scientific explanation after using the inquiry 5E cycle for inquiring knowledge about acid-base theory had the highest average in terms of claims, followed by reasoning, and the lowest was in evidence, respectively. It could be explained that the use of inquiry 5E cycle for inquiring knowledge in teaching and learning reflects the processes, integration, and communication in a form of summary or claim, then show evidence for proving the claim. Lastly, connect the evidence to the claim by using reasoning based on scientific knowledge for the students to understand the phenomenon clearly and correctly. [8] In addition, another study found that the students could develop their scientific thinking processes about the nerve systems and the abilities in inquiring scientific knowledge of grade 11 students. The post test results of the students using the knowledge inquiry in their learning was significantly higher according to the statistics which was at .05 and [9] the study of Biology using knowledge inquiry approach together with the making of argumentation to explain scientifically found that the students in the experimental group had significantly higher scores than the controlled group in terms of the abilities in scientific explanation. The statistics showed the level was at 0.5. Furthermore, the study about [10] the summary of the abilities in scientific explanation of grade 9 students showed that 30% of the students' answers were the summary based on the foundevidence, approximately 52% were based on their personal opinions which could affect the factual alteration, and the rest of 18% was the explanation of the evidence, though without a clear summary or no summary at all. Hence, the students were not able to use the summary in explaining further scientifically. In conclusion, this study proposed an approach in developing the abilities of the students in summarizing and explaining in scientific area.

Suggestions

1. The suggestions for using the result of this study.
   The result of the study found that the use of inquiry 5E cycle for inquiring knowledge for teaching and learning enhance the abilities of the students in scientific explanation. Hence, it is suggested that the use of inquiry 5E cycle should be implemented in the teaching and learning. It shall help the students understand the lessons and enhance the abilities in scientific explanation so that the students will achieve higher scores in their test outcomes.
2. The suggestions for further study.
   The methodology and the result of this study suggested that,
   2.1 The inquiry 5E cycle for inquiring knowledge should be used with other subjects in further research such as Physics, Chemistry, Geology, or Astronomy, with the students from secondary school. Moreover, the lessons should also be appropriately adjusted.
   2.2 More variables should be taken into account apart from the abilities of the students in scientific explanation. More variables can be developed from the teaching plans such as the concepts of scientific processes, analytical skill, synthetic skill,
   inquiring skill, and the attitudes of the students towards science.

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The Curriculum Development of Art Learning Area for 21st Century Education

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Abstract

The purposes of this study were to synthesize and make a comparison between the core curriculum B.E. 2551 and the 21st century curriculum framework of Art learning area for basic education and to develop a model curriculum of basic education in Art learning area based on 21st century learning. The sample groups were selected by purposive sampling. They were taken from 4 levels: grade11, 10, 6 and 1, respectively. They were studying Arts at Demonstration School of Khonkaen University in the Academic year 2017. To form 21st century classrooms, three innovations were implemented. Flipped Classroom was implemented for Grade 11 and 10 students. Grade 6 students learned Arts through mobile phones with 3G network, while Lesson Study was employed for grade 1 students. The instruments for evaluating the curriculum piloting contained lesson plans, worksheets, handouts, students' work assessment forms, students' practices, activity reflection forms, and class observation forms. The learning materials comprised online video clips used via mobile phones with 3G network.

After synthesizing the core curriculum B.E. 2551 and the 21st century curriculum framework of Art learning area, it was found that the 21st century curriculum emphasizes three main issues, including critical attributes, project base, and research driven. Moreover, classroom activities and lessons must be related to the community, whether local or global. Students must be able to collaborate with people from all over the world. Additionally, the curriculum focuses on high-order thinking skills, multiple intelligences, and technology and multimedia skills. The classrooms become a greater community using internet working to support instructions. The students are supposed to be self-directed and have freedom in learning based on individual differences. The instructional activities are challenging rather than focus on textbook driven. The students will learn through doing projects which integrate contents from various learning areas. The students are equipped with research and project conducting experiences. The evaluation processes are shifted from rote learning and knowledge comprehension to practices. The students get involved in evaluation processes through self-assessment. The results of the curriculum development of basic education in Art learning area based on 21st century learning showed that the students' achievement scores passed the prescribed criteria with good and excellent levels. In flipped classroom, students' practices were at good and excellent levels. The students in the classrooms with mobile phones use achieved excellent learning level. In additions, Lesson Study facilitated the students to have thinking skills and certain critical attributes for 21st century learning. Hence, the designed curriculums can be great models for 21st century instructions and learning.

Keywords: *Curriculum Development, Art Group, 21st Century Education*

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Introduction and problem statement

Since the beginning of B.E. 2551, the basic core curriculum has been developed and implemented by the educators for setting it as the national core curriculum for both local and global community, which is calculated as exact nine years of processing. Evaluating the achievement test's score of N.T. (National test) from the students who have passed the basic curriculum, it found that the students' performances in the core subjects such as learning areas of mathematics, Thai language, sciences, social studies, foreign language (English), arts, occupations and technology were still lower than the national standard; moreover, the score was considered as the middle to bottom rank when it was compared to the other members of Asian community. Therefore, the researchers are encouraged to learn and improve the basic education core curriculum of art learning area for a brighter future.

The conceptual framework for the ability of 21st century learning has been widely accepted as the Model of 21st Century Outcomes and Support Systems, for it places the emphasis on the student outcome and the importance of the core subjects. Also, the ability encourages the students for the support in various preparations, which include the learning support, e.g. standard, curriculum - learning and teaching's evaluation, teacher's development, appropriate atmosphere for learning in 21st century.

In the 21st century, it is mandatory that the learning goes beyond the old scheme to the 21st century skills, which the students are urged to be self-directed learners. Processing the skills, the teachers design the learning, and then act as the facilitator guiding the students to study in the aspects of PBL (Problem-Based Learning) or PBL (Project-Based Learning). To complete the mission, the teachers establish the discussion called PLC (Professional Learning Communities), which give them the opportunities to exchange the individuals' experiences to each other. In this modern era, it is quite integral to prepare the students being ready for the current society where it remains tougher every day. Social changes and the educational challenges are the good examples of the obstacles that thoroughly affect the living in the 21st century. Therefore, the teachers need to be alerted and prepared for the learning management, so that they can guide their pupils to the right ways in the 21st century era, which is totally different from the 20th and 19th centuries. Learning skill is considered as the most important skill in 21st century, so it encourages the learners in this era to be possessed of the essential skills, which are the results from the learning and teaching reformation and the other preparations.

Panich (2012) defined "21st Century Learning skills" as the skills that are essential for living in the 21st century. Although subject matter is crucial, it is not enough for living in the 21st century. At present, the subject matter should be learned by the students themselves, which the teachers act as the facilitators and design the activities suited to the students. Ultimately, the students should be able to evaluate their own development and the learning by themselves.

In 21st century era, it is illustrated that core subjects are the crucial factors determining the conceptual framework and key strategies for the interdisciplinary management or the other issues of the 21st century era. The core subjects include native and essential languages of the learning area of art, mathematics, politics, citizenship, economics, sciences, geography, and history that are supported to be meaningful tools for the 21st century skills. The skills can be categorized as the following lists:

1. **21st Century Skills:** The category comprises of the Global Awareness, Financial, Economics, Business and Entrepreneurial Literacy, Civic Literacy, Health Literacy, Environment Literacy.
2. **Learning and Innovation Skills:** This is the one that prescribes the students' readiness for encountering the complicatedness in working career, e.g. creativity and innovatively critical thinking, effective communication and collaboration.
3. **Information, Media, and Technology Skills:** Nowadays, there are a lot of campaigns publicized through the media and online sources, so it is crucial that the learners possess the critical thinking and multitasking skills.
4. **Life and Career skills:** Living and working in the world today successfully, the learners should acquire the following skills:
   - 4.1. Flexibility and adaptation skills.
   - 4.2. Creativity and being independent.
   - 4.3. Social and cross-cultural skills.
   - 4.4. Productivity.
   - 4.5. Accountability.
   - 4.6. Responsibility.
5. **Individual 21st Century Skills:** It is the skills that are life-long learning, which can be abbreviated as the learning of 3R x 7C.

1. 3R stands for 1. Reading - the learners are able to read 2. Writing - the learners are able to write 3. (A)Rithmetics - the learners are able to solve the mathematical problem.
2. 7C stands for 1. Critical Thinking and Problem Solving. 2. Creativity and Innovation. 3. Cross-cultural Understanding. 4. Collaboration, Teamwork and Leadership. 5. Communications, Information, and Media Literacy. 6. Computing and ICT Literacy. 7. Career and Learning Skills.

The concept of the future learning: The learning in the 21st century and its conceptual framework places the emphasis on the strategic approach for the learning management focusing on the knowledge, skill, expertise, and the performance of the learners. Referring from the Partnership For 21st Century Skills, it is stated that the learners will successfully achieve their goals by combining these factors together.

However, some teachers still faces the problems of implementing the core curriculum B.E. 2551. Purposefully, the curriculum is developed for the actual teaching, but it does not match with its primary goals when it is used extensively in the nation. Therefore, it results the researchers being in needs to improve the basic curriculum in the learning area of art; subsequently, this contributes to the efficient practice in the 21st century learning skills.

Research objectives

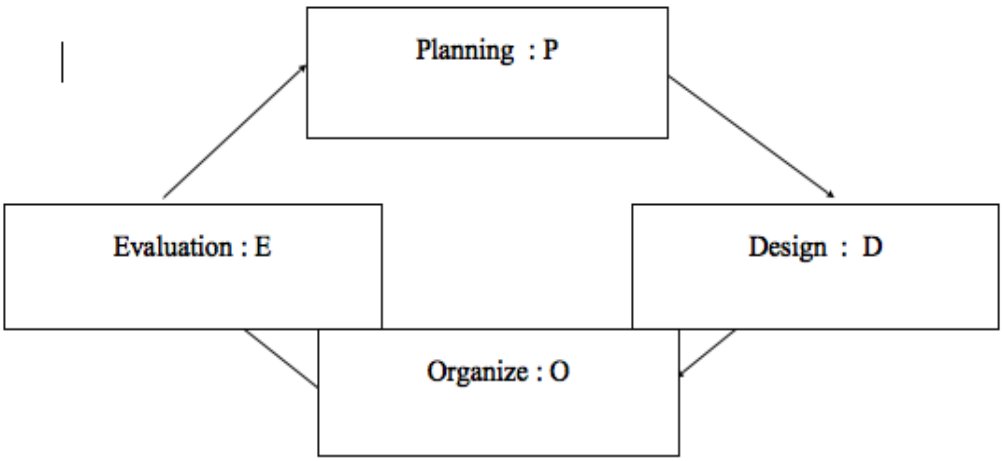
1. To synthesize and make a comparison between the core curriculum B.E. 2551 and the 21st century curriculum framework of art learning area for basic education.
2. To develop a model curriculum of basic education in the learning area of art based on 21st century learning.

Definition of terms

1. The curriculum development: It is defined as the process of synthesis between the core curriculum B.E. 2551 and the 21st century curriculum framework, and the development of the curriculum conforming to the Tyler's model.
2. 21st century learning (21st Century Education): It is defined as the operation of the basic education curriculum in the area of art, which (1) Using the innovative learning as in the flipped classroom with grade 11 and grade 10 students and (2) Using the innovative learning by using mobile phones for the work of art with the grade 6 students. Finally, using the innovation of lesson study that is the way of utilizing the open class method in grade 1 students.

Methodology

This study can be specifically categorized as the action research, which is one kind of the R&D method. Normally, the action research aims to investigate the variables systematically while keeps looking for the new ways for implementing the study into real life. Operating the research, it is initially developed from the R&D process (Research and Development process) and evaluated before making available for the public. This action research cites Wongwanich (2011) as the reference, whose concept is inspired from Tyler's Model Curriculum Development. Hence, the model of Tyler is illustrated below:



1. Planning means the process of planning the curriculum.
2. Design means the process of designing the curriculum.
3. Organize means the process of planning how to use the curriculum.
4. Evaluation means the process of evaluating the use of the curriculum.

Scope of the study and basic assumption

This research aims to synthesize and compare the core curriculum B.E. 2551 to the 21st century curriculum framework of art learning area for basic education.

Populations

The research comprises of the students of Demonstration School of Khonkaen University in the Academic year B.E. 2559. The population are divided into 4 groups and

later processed through the purposive sampling method: 1 group of grade 1 students, 1 group of grade 6 students, 1 group of grade 10 student, and 1 group of grade 11 students.

Variables

1. Independent variable(s): The curriculum development of the learning management in the 21st century.
2. Dependent variable(s): The results of the curriculum development in the learning area of art in the 21st century.

Instruments

1. The model curriculum of the basic education in the learning area of art that utilizes the innovative learning from the learning in the 21st century, which the innovation comprises the followings:
   1.1. The innovative learning of flipped classroom of the grade 11 students for the subject of visual communication design, which also includes 3 lesson plans, worksheets, handouts, students' practices, and online video clips used via mobile phones with 3G network. Furthermore, students' practice assessment forms, and the Rubric reflection forms are used to evaluate their satisfaction.
   1.2. The innovative learning of flipped classroom of the grade 10 students of Demonstration School of Khonkaen University (Mor Dindaeng) for the issues of line, color, creativity in visual arts. There are 4 lesson plans, handouts, students' work assessment forms and students' satisfaction forms.
   1.3. The innovative learning of using mobile phones for the creation of artwork of the grade 6 students, which comprises of 2 instruments: 3 lesson plans for using the mobile phones to create the artwork, students' work assessment forms who use 3G network mobile phones.
   1.4. The lesson study is used via the method of open class for the grade 1 students. Operating the class, a lesson plan, activity reflection forms, class observation forms, and activity reflection forms are used as the instruments in the study.

The procedures for developing the model curriculum

2. The followings are the procedure of the data collection.

   2.1. The process of planning.

      2.1.1. Study the basic education curriculum B.E. 2551.

      2.1.2. Study the forms of the 21st century curriculum.

      2.1.3. Study the essential innovation for the 21st century curriculum.

   2.2. The process of designing.

      2.2.1. Analyze the basic education curriculum B.E. 2551.

      2.2.2. Analyze the curriculum that is suitable for the learning in the 21st century.

      2.2.3. Analyze the innovation that is suitable for the learning in the 21st century.

2.2.4 Develop the model curriculum and the learning management in the 21st century.

2.3. The process of organizing.

2.3.1. Create the curriculum that is suitable for the 21st century.

2.3.2. Test the use of the curriculum.

2.3.2.1. The innovative learning curriculum by using the flipped classroom in the subject of visual communication design for the grade 11 students.

2.3.2.2. The innovative learning curriculum by using the flipped classroom in the issues of line, color, and creativity in visual arts for the grade 10 students.

2.3.2.3. The innovative learning curriculum by using mobile phones for creating the artwork for the grade 6 students.

2.3.2.4. The innovative learning curriculum by studying the lesson and utilizing the open class method in the subject of art for the grade 1 students.

3. The evaluation is processed as the followings:

3.1. Analyze the use of the curriculum and summarize it accordingly to the set objectives.

3.2. Evaluate and confirm whether the results conform to the main objectives of the research.

Statistics for data analysis

The common statistics used in the research are the followings:

1. Percentage (%).
2. Mean ($\bar{X}$).
3. Rating scale.

Results

1. **The synthesis of the conceptual framework underlying the learning in the 21st century.**

The learning area of art

The four important pillars that is the core for the long live learning in the 21st century learning announced by the international commission in B.E. 1995:

1. Learning to know: It is the learning that urges the learners to learn themselves, as well as the others, in the society.
2. Learning to do: It is the learning for implementation, which is supported by the learners' world knowledge and their working experiences.

3. Learning to Live Together: It is the learning to understand the others, and realize that we all have to collaborate with each other. Moreover, we all need to realize that the individuals possess the different kinds of characters; therefore, we should be eager to collaborate when the problems occur.
4. Learning to be: It is the learning that improves the individuals' personalities and managing skills with a cautious consideration; also, it enhances the responsibility of the learners as well. Additionally, an educational administrator should support all of the individuals' competences, e.g. memorization, reasoning, appreciation of art, physical fitness, communication ability, the use of technology and ICT for learning.

The 21st century curriculum is likely to place to emphasis on the issues of critical attributes, interdisciplinary, project base, and research driven linking the local community with the government sector, the nation, and the world. Occasionally, the students are able to collaborate with the projects globally. The goal of the curriculum is to emphasize the process of high-order thinking skill, multiple intelligences, and technology and multimedia skills. The multiple basic knowledge for the 21st century is evaluated from the actual circumstances; besides, the learning from the service is also one of the important elements of the curriculum.

The classrooms become a greater community using internet working to support instructions. The students are supposed to be self-directed and have freedom in learning based on individual differences. The instructional activities are challenging rather than focus on textbook driven. Moreover, the learning tends to give the importance of the project driven, integrated teaching, and the contents learnt through the experiences of conducting the projects. The process of evaluation will be shifted from the rote learning and the comprehension of the knowledge to practices. Furthermore, the students are also given the opportunity to assess themselves.

2. The development in the model curriculum in the learning area of art for supporting the learning in 21st century

Referring to the results of the synthesis of the conceptual framework, the researchers develop the curriculum as the followings:

1. The flipped classroom is used in the class of the grade 11 students at Demonstration School of Khonkaen University, who learn the subject of visual communication design in the chapter of Ceramic Porcelain (ceramic) design.
2. The flipped classroom is used in the class of the grade 10 students at Demonstration School of Khonkaen University, who learn the issues of line, color, and creativity in visual arts in the learning area of art.
3. The mobile phones are used in the class of the grade 6 students at Demonstration School of Khonkaen University for artwork creation.
4. The innovation of lesson study is used in the class of the grade 1 students at Demonstration School of Khonkaen University for the learning management.

The summary of the curriculum development

1. The result of the curriculum development for supporting the creativity of artwork by using the flipped classroom in the class of the grade 11 students learning the subject of visual communication design in the chapter of Ceramic Porcelain (ceramic) design.

The result showed that the creativity of 5 students in the grade 11 had the mean of 58.2 priory the learning management, but increased to 66.4 after the activity. The students passed the prescribed criteria of 80% that was set by the researchers, i.e. the students were able to overachieve with 92%. In the satisfaction, it was categorized into 2 main points, which were (1) the students' satisfaction toward the teachers' quality (2) the students' satisfaction toward the flipped classroom. The result showed the score of excellent 4.72, which was calculated as 96% that was quite higher than the prescribed criteria of the researchers.

2. The result of the curriculum development in the class of the grade 10 learning in the learning area of art in the issues of line, color, and creativity in visual arts.

The result showed that the creativity of 10 students in the grade 10 passed the 80% prescribed criteria with 86.5%. In the satisfaction, it was categorized into 2 main points, which were (1) the students' satisfaction toward the teachers' quality and learning management. The result showed the score of excellent 4.54, which was calculated as 90.80 that was higher than the 80% prescribed criteria.

3. The result of the curriculum development of the learning management by using the mobile phones in the class of the grade 6 in the artwork creation.

The result showed that the mean of the students' artwork score was 3.84 calculated as the excellent grade of 96.15%; moreover, the common learning management was excellent as well. The learning management by using the mobile phones for artwork creation was rated as good and excellent grade, which was calculated from 96% of the students. Evaluating 3 lesson plans, it found that the mean score was in excellent grade of 96.15%. Therefore, it could be summarized that this learning management supported the research objectives and conformed with the skills for managing the learning in the 21st century efficiently.

4. The result of curriculum development of the learning management by using the innovation of lesson study for the students in the grade 1

This study aimed to investigate the concepts of the 39 students in the grade 1 at Demonstration School of Khonkaen University. The result showed that the problem for arranging the activities in the subject of art were (1) In the student part, the students were lack of the thinking process skill and the students had low participation in the class noticed from the thinking according the teachers' lecture, answering question in the class, expressing the opinion, being able to express in front of the class, presentation, summarizing the lesson with the teachers (2) In the teaching part, the teaching provided few opportunities for the students to express what they have got, using the rote question in the class, the boring and non innovative activities could not draw the students' attentions efficiently. If the subject of art was viewed as the one available for showing the freedom expression, it should, therefore, link to the students' actual use in their lives.

Reviewing the received information, it made the researchers interested in studying the grade 1 students by arranging the learning activity Cute Animal Sculpture with the innovation of lesson study by the method of open approach. This activity aimed to improve the thinking process, other characteristics with full efficiency; moreover, it encouraged the students to study the subject of art joyfully according to the set objectives. Hence, it could be summarized that students learned the thinking process toward work of art by themselves, and the thinking process was characterized as the vary procedure, i.e. the critical thinking is the

way of dividing or zoning your information, logical thinking, fluency thinking, and precise thinking. Noticed from the expression in front of the class, there were the improvements in reasoning, planning, being sharper in their responses toward the problems and solutions to the problems. Noticed from the presentation of the lesson plan, it improved the collaboration skills, receiving and expressing the opinions that showed the ideal character in the class. As the problems occurred in the class, the teacher satisfied with the atmosphere in the class urging the collaboration between the students and the teachers to find the solutions. The order of the teaching and the classroom management were systematic and clear, so that it was very easy to observe the overview problems or even the tiny ones in the class. Finally, these problems would be pended on the lists, and later be solved for the better learning and supporting the thinking process in the learning management.

By piloting the four curriculums, it found that all of them promoted the students' scores higher than the prescribed criteria at the level of good and excellent; moreover, the students in the flipped classroom depicted an excellent and good in the practices. The learning by using the mobile phones for creation of artwork was well fitted in the 21st century era. Besides, the innovation of lesson study improved the students' thinking process and other important characteristics at full capacity. Therefore, it could be said that the 4 model curriculums developed from this research could be used as the models for the good learning management for developing the curriculum in the 21st century efficiently.

Discussion

In the study, the researchers use 4 curriculums, which support the learning in the 21st century, to collect the data. First of all, the flipped classroom approach is used with the grade 11 students, who take the course of the subject of visual communication design. The result shows that the students overachieve the prescribed criteria with 92%, and the their satisfaction rates equal 96% both conforming with the curriculum development. Furthermore, it highlights its importance by further implementing to the grade 10 students earning the 86.5% with their work performance and excellent level of 90.80% with their satisfaction with the approach.

Thirdly, the curriculum development by using mobile phones with the creativity of artwork in the grade 6 students illustrates that 96% of the students reaches the excellent grade in their average grade. Finally, the curriculum development by using the innovation of lesson study with open approach in the grade 1 students shows the improvement in thinking process of the students. For example, the processes grow more various, i.e. their critical thinking, fluency thinking, logical thinking, precise thinking process are developed. In other words, the students are taught to be self-directed**.** Additionally, their collaboration skill is also enhanced by implementing the curriculum with the good end excellent level. Therefore, these four developing curriculums in the learning in the 21st century should be used as the model one, which supported the learning skill in the 21st century, and further implement to the current curriculums for the students**.**

Recommendations

Summarizing the analyzed data, it can be recommended as the followings:

1. It is recommended to thoroughly and systematically analyze the learning in the 21st century, which fitting to the students' expectations.

2. It is recommended to design the curriculum conforming with the context of the schools and the individual students.

Further study

1. It is recommended for piloting the curriculums with the different types of samples for studying its results, which is considered unstable.
2. It is recommended for implementing each type of curriculum to the other institutions, which possess the similar contexts and conform with the certain learning managements.

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Representations in Flow of Lesson in Classroom Using Lesson Study and Open Approach

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Abstract

This study aimed to explore representations in flow of lesson in classroom using lesson study and open approach. This research was the qualitative research that emphasized on protocol analysis and analytical description. The target group was 3th grade students at Lakmaungmahasarakham School in the first semester of 2017, where has been participated in the project for Professional Development of Mathematics Teachers through Lesson Study and Open Approach. The data was collected by using lesson plans, field notes, student worksheets, video recorders, audio tape recorders, and images recorders. The data used for analysis were composed of 1) protocols of the students' activities in the classroom, 2) photographs of the students' works and 3) data from field notes. Researcher had collected the data in classroom by using lesson study and open approach of Inprasitha (2011)'s framework. Researcher analyzed the data, according to Inprasitha (2016)' flow of lesson framework.

The results of this research were students, in classroom using lesson study and open approach, It was showed representations in flow of lesson 3 steps; 1) Representations of real world, Students can explain knowledge and experiences in their real life by their own understanding, according to content in each periods. Using various representations to explain their idea. 2) Semi concrete acids, Students can explain how to solve the problems, according to content in each period to represent Mathematical world and 3) Representations of mathematical world, Students can explain the idea through rules, formulates, mathematical symbol and number that according to the content of each period.

Keywords: *Representations in flow of lesson, Lesson study, Open approach.*

Introduction

Many classes use traditional teaching methods, not focusing on students' thinking processes and ideas. It also overlooks the learning process skills that are necessary for students, so students lack of understanding to learn and represent their ideas in mathematical problems solving, so students can not represent a wide variety of mathematical meanings. This Innovation can help designing of instructional management that emphasized on processes , to conceptualize and represent ideas to explain students' understanding and problem solving (Inprasitha, 2003).

Lesson study is a way to promote and allow teachers to have an opportunity to share, learn, and understand together for preparing a lesson to let students create mathematical ideas and develop ideas for self-understanding. There are 3 lesson study processes; 1) collaboratively design a research lesson, 2) collaboratively observe the research lesson and 3) collaboratively discuss and reflect the research lesson. The innovation is different from traditional teaching because this innovation didn't focus on just result but focus on the ideas that arise from problem

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solving of students. The goal is to make traditional classroom to be a problem- solving classroom with a teaching method called Open Approach. (Inprasitha, 2010)

Open Approach is a way to have an opportunity to students learn by themselves, have independent thinking and show different answers from open-ended problem that teachers have created. There are four steps: 1. Posing open-ended problem 2. Students' self-learning 3. Whole class discussion and comparison and 4. Summing up by connecting students' emergent mathematical ideas (Inprasitha, 2010). It is also a teaching method that focuses on problem solving and controlling the flow of lesson so that mathematics classroom are meaningful to students. They can help the student to understand the learning and can represent ideas problem solving with understanding by representation to represent flow of lesson.

Flow of lesson have the role for helping students to look and understand the process learning mathematical symbols (Inprasitha, 2016) to place the flow of lesson so that students can use the methods. They have learned earlier to be used as a tool to solve the problem and to be the next learning method (Isoda, cited in Inprasith, 2012). According to the design of the new mathematical teaching activity, the flow of lesson is a guideline for starting classes in order, which designed with regard to the content and students ideas for the mathematic classroom to flow with understanding. Each design direction step represents the real world to the mathematical world described through the representation stage.

Duval (2002) to show that mathematics can accessible through representation. Interoperability of various representations can be a powerful tool to illustrate the different aspects of one mathematical idea. Some research also shows that using more than one representation may help students gain a broader perspective, more flexible and more effective in understanding mathematical ideas. Representation at each level is a bridge between concrete and abstract, with numbers and symbols that are beneficial to the learner and the representation of concrete is connects mathematical ideas to real world experiences. (NMAP, 2008)

From the above, shows that Lesson Study and Open Approach are innovations that help create ideas and representations to student problem solving. Representation is necessary and important in explaining the student's problem solving ideas. Nevertheless, representations are lack of connection with the teaching methods and the hierarchy of teaching methods. Therefore, the researcher explored representations in flow of lesson in classroom using lesson study and open approach to understand the ideas and learning of students. According to flow of lesson to through three stage of representations: representations of real world, semi concrete aids and representation of mathematics (Inprasitha, 2016)

Research purposes

This study aimed to explore representations in flow of lesson in classroom using lesson study and open approach**.**

Terminology

1) **Lesson Study** means a way to promote and allow teachers to have an opportunity

to share, learn, and understand together for designing instruction that students can represent variety of ideas for problem solving. There are three processes of lesson study according to Inprasitha (2011):

1.1) Collaboratively design a research lesson means teachers and lesson study team to share ideas in problem-solving design that students have access to and become their own problems. By finding the real world of students in line of their daily lives and the content of the session.

1.2) Collaboratively observe the research lesson means teachers and teams to observe each other. Learn and understand what the real world or real-world representation of a student is through an open-minded teaching approach that emphasized student-centered ideas and representation in a variety of classes

1.3) Collaboratively discuss and reflect the research lesson means teacher and the team to exchange views by observing the performances taking place in the classroom, to improve and develop the next teaching.

2) Open Approach means teaching methods that allow students to learn by themselves, have independent thought, show different ideas and answers from open-ended problems and a way for teachers to have the opportunity to observe the ideas that occur in a student's classroom. By teaching this way, students can be represented in classroom. There are four steps:

2.1) Posing open-ended problem means teacher presents an open-ended problem situation created from the real world. Students can involve and have their own problems.

2.2) Students' self-learning means teachers take time for students to think and solve the problems by not interfering with student thinking. Their learn to solve problems and the teacher observed the problem solving of the students and arranged the sequence of ideas for the next stage.

2.3)Whole class discussion and comparison means teachers choose some students presented own ideas and discussion in the whole class.

2.4) Summing up by connecting students' emergent mathematical ideas means teachers summarize ideas and representations that occur in class based on students' ideas.

3.) Flow of lessons means the teaching sequence is attached open approach with describe through representation 3 steps:

3.1) Representations of real world, students can explain knowledge and experiences in their real life by their own understanding, according to content in each periods, by using various representations to explain their idea.

3.2) Semi concrete acids, students can explain how to solve the problems, according to content in each period to represent Mathematical world.

3.3) Representations of mathematical world, students can explain the idea through rules, formulates , mathematical symbol and number that according to the content of each period.

Research methodology

1) Focus group

The focus group of this study were 20 grade 3th students, first semester, 2017 academic year form Lakmaungmahasarakham School, Talad District, Maungmahasarahkam District, Mahasarakham Province. These students had studied with open approach for a year when they were in 2th year elementary education level, 2016 academic year.

2) Research tools

2.1) the data collection tools were; lesson plans, field notes, student worksheets, video recorders, audio tape recorders, and images recorders.

2.2) the data analysis tools were; protocols of the students' activities in the classroom, photographs of the students' works and data from field notes.

3) Data collection

The researcher observed the 3th elementary education mathematics classroom situation in order to familiarize to the students and teachers and then conducted the whole class learning management planning with the researcher, teachers and classroom observers. The complete learning management plan was adapted for 3th year elementary students' learning activities providing including the observation from observers, teachers, researcher and assistant researchers. The observation would not interfere in students' idea. We recorded the video of classroom situation and photos in classroom. The results reflection have been conducted.

4) Data analysis

This research was the qualitative research that emphasized on protocol analysis and analytical description. Researcher had collected the data in classroom by using lesson study and open approach of Inprasitha (2011)'s framework. Researcher was analyzed the data, according to Inprasitha (2016)'s flow of lesson framework.

Conclusion

From the survey of representations in flow of lesson in classrooms using lesson study and open approach found that, representations in flow of lesson 3 steps according to flow of lesson framework of Inprasitha (2016) and open approach of Inprasitha (2011) as follows:

1) Representations of real world, Students can explain knowledge and experiences in their real life by their own understanding, according to content in each periods. Using various representations to explain their idea.

Example: From protocols of the students' activities in the classroom

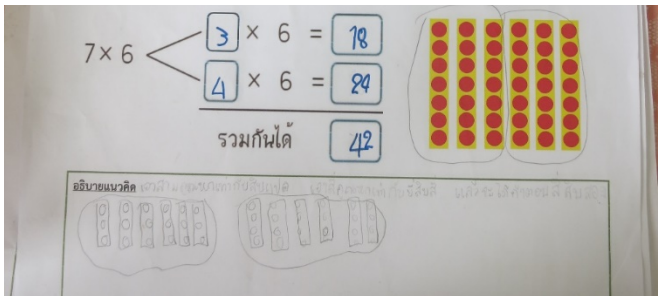
Teacher: What does 7 multiplied by 6 mean?

Students: There were 6 members in 7 groups.

Students can explain the meaning of 7 multiplied by 6 from their prior knowledge and prior material.

2) Semi concrete acids, Students can explain how to solve the problems, according to content in each period to represent Mathematical world.

Example:



Students drew paper tapes to explain the meaning of 3 multiplied by 6 by drawing three points on each of the six paper tapes and explained the meaning of 4 multiplied by 6 by drawing four points on each of the six paper tapes.

3) Representations of mathematical world, Students can explain the idea through rules, formulates, mathematical symbol and number that according to the content of each period. Example: From protocols of the students' activities in the classroom

Teacher: We part 7 multiply by 6 into 7 multiply by 3 and 7 multiply by 3 the result of both method is equal ?

Students: Equal.

Students understand the relationship of multiplication by represented by words.

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The Results of Using CIPPA Model in Physics Learning Activities about Momentum and Impulse for 10 Graders of Demonstration School of Khon Kaen University, Secondary School (Mo Din Daeng)

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Abstract

This research was aimed to study the results of using CIPPA model in Physics learning activities for 36 students from the 10th Grade who enrolled in Physics subject for 2nd semester of 2016 academic year at the Demonstration School of Khon Kaen University, secondary level (Mo Din Daeng)

The research was the One-Group Post Test only design and the research instruments were consisted of CIPPA model Lesson plans, record of teaching and learning behaviors, teaching reflection, interviewing and the achievement tests. The Data analysis was divided into two types which were: 1) the qualitative data analysis conducting by interpreting the information and 2) the quantitative data analysis conducting by finding arithmetic mean and percentage.

The results indicated that by using the CIPPA model in Physics learning activities, the students could be able to participate in class through the body, intellect, emotions and society. Students learnt by doing, therefore, they could be able to construct the knowledge by themselves. They further interacted with the teacher and peers by working as teamwork. From this activity, they were trained to understand their roles and duties, daring to express their ideas and opinions in class discussion. They could exchange their ideas, participated in classroom activities and were creative to produce and present their works and projects.

Overall, students were enthusiastic to learn and they enjoyed learning. They could also apply their knowledge to use in situational scenes set by the teacher. It was further found that students achieved the average scores of 12.50 points out of 15. The result showed that 26 students which could be calculated as 60% of the participants passed the criteria set at 72.2% of the total score.

Keywords: *CIPPA Model*

Paper Instruction

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Background and Signification

Nowadays, there is the reformation of the education, which is the beginning of The National Education Act B.E. 2542 (1999). It is really necessary for students because there are 4 different ways of educational management that emphasizes student-centered learning. Moreover, it valued students to use the self-learning process, which has the activity that emphasizes the student-centered learning. However, the result shows that it does not as focus on the student-centered learning as it should be due to the environment of study, the time is not enough for teaching, and the students themselves. The student might not courage to express their emotional or to make friends to each other. Sometimes they go to school for just listen to the teacher while they're studying and this is the main problem that reaches all students to be less of thinking, problem solving, and social skills development that might affect to the achievement level of study (Pimphan Dechakupt, 2001). Therefore, the teachers need to know how to improve their students in every field, teach them to make the successful job by themselves, teach them to find everything that they want to know by themselves, and the scientific attitudes of students. While the students are in class, teachers should create the activity that every student can join together then they can achieve self-learning process (Tisana Kamanee, 1999). If students got an opportunity to use thinking skills by follow the scientific method, the students would knew how to solve the problems and knew how to adapt themselves to the society.

Therefore, teachers should find an appropriate teaching method and the activities, which can let all students try to find everything they want to know by themselves, by using scientific method. All teachers are the planer and supporter for all students by creating the activities that uphold the class-interested of students. However, there is still no evidence to proof that which teaching method is the best for students; therefore, teachers should always realized that an effective teaching is related with an improvement of learning and should find the best discretion in choosing teaching method that suitable for students in term of the ability of students, the content of study, and teaching materials.

From all problems that mentioned and the needs to improve the students, this is reaches to the idea to use CIPPA Model in teaching process with the fully-hoped that it could be beneficial for students and teachers. Furthermore, to relate with The National Education Act B.E. 2542 (1999) section 4, which define to create teaching method that mainly emphasizes in students. CIPPA Model has been improved by Tisana Kamanee (1999), which can be used to improve students in every field, such as body, mood, brain, and society. The principle of CIPPA Model is mostly emphasized in students. It focus on making the students to join in teaching process, let them know how to work in team, and let them make friend to each other and teach each other the new things. Moreover, the students can study along with producing the good quality workings and can use the knowledge that they've got adapt into their real life.

From the principle that mentioned above, the researchers generalize that using the CIPPA Model in teaching process might be beneficial for all students and students can use their thinking process while they're in class. Moreover, this group of students can live in the society with harmony and can be the powerful people to help nation's development in the future.

Objectives

To develop the learning achievement of Physics subject in grade 10 class 2 students from the Demonstration School of Khon Kaen University, Secondary School (Mo Din Daeng). The students will be taught about Momentum and Impulse by using CIPPA Model in teaching process. The objective of this research is the students will get 70% of learning achievement by more than 70% of students are pass the criterion.

Scope of the Research

1 The subject of this study is Physics for grade 10 students and the content is about Momentum and Impulse.

2 The target group is grade 10 class 2 students from The Demonstration School of Khon Kaen University, Secondary School (Mo Din Daeng), second semester, academic year 2017, total number is 36 people.

Expected Benefits

1 To be a guide of changing the instruction process and students can improve their physical, emotional, intellectual, and social skills including they can realize how much value they have in themselves.

2 To have a new style of Physic instruction by using CIPPA Model for grade 10 students and this is also beneficial to teachers to adapt this teaching process for their own classes.

The teaching process that focused on student-centered learning.

1. The meaning of the teaching process that focused on student-centered learning

Tisana Kamanee (1998) said that the teaching process that focused on student-centered learning means the learning activity that allow the students to participate in term of physically, intellectually, socially, and emotionally.

Aroon Songngamsub (1998) said that the teaching process that focused on student-centered learning means the process that teachers create for students to encourage them to research everything by themselves. The teachers always support and be the data resources for students and always focus on students' emotion, mind, and age.

Wattanaporn Rangubtuk (1999) said that the teaching process that focused on student-centered learning means the teaching process that focus on the activity which is related to students' daily living and ability. This teaching process allows students to participate in every steps of the process to become the self-learning process.

The Subcommittee of Reforming Learning (2000) said that the teaching process that focused on student-centered learning means to target the learning resources, learning materials, and the evaluation that aimed to develop "people" and "life" to get the learning experience and meet the fully needs and interests of students.

The teaching process that focused on student-centered learning by using CIPPA Model

1. The concept of CIPPA Model teaching process

The teaching process that focused on student-centered learning by using CIPPA Model is the learning activity that allows students to participate in the learning process to meet the objectives of learning. Tisana Kamanee (1999) gave the information about the concept that can lead to the creation of the quality learning activity as follows.

1. The activity that allows students to have physical participation is the activity that let all students to move their body for motivating their sensory perception to be ready for the class. Therefore, the activity should be the one that let students move their body step-by-step according to their interests.

2. The activity that allows students to have intellectual participation is the activity that could motivate students' brains and make students feels fun to think and to remember all knowledge

that teachers will give to them. However, the information that teachers will give to the students should not be too difficult or too easy for students but should be appropriate with their age and ability.
3. The activity that allows students to have social participation is the activity that let all students have an interaction with people or environment. Therefore, a good learning activity should be the one that encourage students to learn from the environment.
4. The activity that allows students to have emotional participation is the activity that could affect to students' emotion and self-esteem. Therefore, the activity should related to their daily living, experience, and the reality of life.

2. The principle of CIPPA Model

From the concept for creating the teaching process that focused on student-centered learning, Tisana Kamanee (1999) had concluded the origin of the word "CIPPA" as follows.

"C" refers to the word "Construct", which is means the creation of knowledge based on the Constructivism Theory. In other words, a good learning activity should be the learning activities that can help the students know how to create their own thinking process and students can be a part with their intelligences. This learning activity could support students to have many thinking process creation skills, such as courage to think, show, and decide.

"I" refers to the word "Interaction", which is means having the interaction with people and environment. A good learning activity need to help students to have an interaction with each other, know each other, and social involvement.

"P" refers to the word "Physical Participation", which is means participating in physical learning activity. A good learning activity must let students to be a part of learning process as much as they can.

"P" refers to the word "Process Learning", which is means the learning about each process. A good learning activity must let students know about the process of a good learning, such as knowledge acquisition skills, process thinking skills, problem solving skills, group process skills, and self-improved skills. Studying about the processes could be another way to help student to improve their intellectual skills.

"A" refers to the word "Application", which is means using the knowledge that the students have got and adapt it to use in their daily life. The learning activity that only gives students about the content of those subjects is not as good as the activity that let all students adapt the information into their life. Moreover, they can use it to be a good person and know how to live with people in the society.

3. The principle of the teaching process that focused on student-centered learning by using CIPPA Model should have features as follows (Tisana Kamanee, 1999)
1. To support students to be a part of learning process and let them construct, including try to understand, try to research, think, and summarize all knowledge by themselves.
2. To support the participation of the students in term of:
    2.1 The number of students
    2.2 The quantity of participation
    2.3 The quality of the process
3. To support the interaction between the students, including an exchange of the information and experience as much as you can do in term of:
    3.1 The number of students
    3.2 The quality of the process
    3.3 The quantity of participation
4. To support the students to learn about the "process" with the "product".
5. To support the students to apply their knowledge to use in their life.

4. The steps/processes of the learning that focus on student-centered by using CIPPA Model (Tisana Kamanee, 1998)

1. Introduction: Construct or encourage the interests of the students to be ready for class.
2. Activity: Create the activity that leads the student to the purposes.
3. Analyze and Debate the Results:
    3.1 Analyze and debate the product from the activity
    3.2 Analyze and debate the process of the study
4. Conclusion and Evaluation of the study based on the objectives:

From 4 steps above, it can be written more clearly in term of the creation of learning activity as follows (Tisana Kamanee, 1999)

Step 1: The Review of Background Knowledge

In this step, the students will be reviewed about their background knowledge and prepared to be ready to link their old knowledge with the new one.

Step 2: The Researching of New Knowledge

In this step, the students will get new knowledge from researching by themselves or the teachers could prepare it for them.

Step 3: The Learning of New Knowledge Linking with Old Knowledge

In this step, the students need to study and try to understand all knowledge that they've got. Moreover, students need to describe the meaning of the information or new experiences by themselves, including the group process that each student have to debate and summarize all information. Therefore, knowing how to link old and new knowledge together might important in this step.

Step 4: The Exchange of the Knowledge within Group

In this step, the student will exchange their knowledge in group to recheck the accuracy of understanding. Furthermore, this could help student to get more information from their friends and they can share it to improve their skills together.

Step 5: The Summarizing and Organizing of the Knowledge

This step is all about the summarizing of all information that the students have got, including old and new knowledge, to make it easy to memorize.

Step 6: The Display of the product

The students will get an opportunity to show their works/products to everybody. The students can recheck the understanding of themselves and it can support the creativity of students.

Step 7: The Applying of the Knowledge

This is to support all students to know how to adjust their knowledge into the situation in their life to know how to solve problems in each situation.

Action Research

.1The Description of the word "Action Research"

Yajai Pongboriboon (1994) described the meaning of the word "Action Research" as it is one of the research types that use an action process systematically. The researchers and participants associated in the process of action and evaluation in 4 steps, which are planning, launching, observing, and reviewing. These 4 steps will lead to the development of planning until they find the way to solve the problems. Moreover, Zuber and Skerritt (1991, was mentioned in Yajai Pongboriboon, 1994) given the description of action research in form of The CRASP Model.

Related Literatures

The researchers studied about the literatures, which are related to the teaching process that focused on student-centered learning by using CIPPA Model, to show how to adapt it to use in the real learning activity as follows.

1. The related literatures of the learning activity that using CIPPA Model

Adisorn Siri (2000) researched about the student-centered learning development by using CIPPA Model in Biology class for 11 graders in form of action research. The researchers created the teaching plan, which is suitable for all students and related to CIPPA Model, focused on 7 steps of CIPPA Model. The result shows that each step can be used in the real teaching process and it works well. However, there are some problems and obstacles in this teaching process such as in Linking Old and New Knowledge step, students cannot understand it clearly; therefore, the teacher let all students to brainstorm together in their group and debate in front of the class to make them understand the information more clearly. Moreover, the teacher found that at the beginning of the class, student need some more time to try to understand what they have to do; therefore, there is not enough time to teach them about the content. In other words, the teachers also need to learn how to manage the time in this process. From the results of the study, it was found that all students are understand more clearly about the content, interested in the content due to the participation of the learning process, enjoy the class, and they can improve their learning skills. Furthermore, students have learnt how to live in their daily living and how to link old and new knowledge together by using their creativity from both the class and practicality. To study about the learning achievement, it was found that all students get more than 60% of the score and students who reach the goal is 100% of the total number of the students.

Nithiyaporn Praserthsung (2002) researched about the development of Sciences learning activity, the content is Human Mechanism, 8 graders by using CIPPA Model. The result shows that this activity can let all students to participate in physically, emotionally, socially, and intellectually. The students can do everything by themselves and having the reaction between their friend and teacher in term of actions and feelings. Moreover, students can debate and share their opinions together, support each other, and work together; therefore, students can know how to apply these skills into the situation in their life. Furthermore, this activity is really suitable for the needs and interests of the students because they are really active and enjoy to learn and to get new experiences. The results of learning achievement of the students reveal that 80% of the students were reached the goals of the study. In other words, they got 60% of the total score. From the study of the research about the learning activity that focused on student-centered by using CIPPA Model can be summarized that this learning activity can help the students to get the higher learning achievement, feels enjoy to study, can work in team, and research everything by themselves. Therefore, the researchers trust that CIPPA Model is suitable to use in Biology class due to it can help all students to improve themselves and it can match with an education policy.

2. The related literatures about action research

Suneerat Niamsalut (1998) researched about the learning management about environment by using action research to develop the knowledge, attitude, and behavior of 6 graders. The target groups are the researchers and assistant teachers in the total number of 3 people and grade 6 students 17 people. The results of qualitative research reveal that all students can get new knowledge and experiences, can work together, and develop an opinion for the environment by using learning management with action research. In term of quantitative research, it was found that the students have the higher of development level and statistically significant at the

.05 level. For an attitude section, it was found that the students had developed their attitude level for an environment at the .05 level statistically significant.
Prom Pookduang (1999) researched the results of teaching based on Constructivism theory and the result shows that teaching based on Constructivism theory and Underhill (1991) associated with action research is the activity that allows students to face with problems and learn how to solve it. Moreover, students can get new experiences and can exchange their opinions with their friends. However, teachers should prepare learning material, which can make all students interested and more courage to speak. For the Science learning achievement, in the content of World and Change, found that all students get higher level at .05 statistically significant.

Yodkwan Kingmanee (1999) researched about the development of learning activity by using simulate situation in Environmental Sciences subject for grade 10 students. The results show that the teaching with simulate situation along with using action research makes all students get full of knowledge, active, enjoy to study, and participate in classroom. Moreover, students can debate and share their opinions within group, got an experience about problem solving, reasonable decided skills, and listen to each other carefully. Furthermore, the learning achievement of all students from studying Environmental Sciences subject, the content of Human and Natural Resources is higher after they were taught by using simulate situation with action research.

This chapter shows the summary of the results of using CIPPA Model in Physics learning activities about Momentum and Impulse for 10 graders as follows.

The Objectives of the Research
To develop the learning achievement of Physics subject, Momentum and Impulse, for grade 10 students of The Demonstration School of Khon Kaen University, Secondary School, (Mo Din Daeng) by using CIPPA Model with the expected average point at more than 70% and 70% of the total number of students.
The Researchers
There are 4 teachers and 46 students from grade 10 class1, 1st semester of the The Demonstration School of Khon Kaen University, Secondary School, (Mo Din Daeng), Muang District, Khon Kaen, participate in this research.
Target Group
The target group of this research is grade 10 class 2 students, 1st semester, 2017 from The Demonstration School of Khon Kaen University, Secondary School (Mo Din Daeng), Muang District, Khon Kaen.
Research Format
This research has only one group and has post-test by only test about the learning achievement after the class using the format as follows.

X O

X is the teaching method that used the CIPPA Model
O is the post-test of the learning achievement after the class for all students

Research Tools

.1The tools used in this research

1.1 Learning Management Plan is the plan that adapts CIPPA Model into the learning activities for 10 graders about Momentum and Impulse, total number is 6 plans.

.2The tools used to reflect performances

2.1 The recording of learning behavior is the record that the researchers created for the teachers to use in the observing of learning process

2.2 The questionnaires showing the learning achievement is the paper for all students to comment about the learning process, including the suggestions. All questions are opened-question.

2.3 Interviewing is the recording between the researchers, teachers, and students by determining the scope of the interview.

3. The tools for evaluation the quality of teaching process

3.1 The test to evaluate the learning achievement is the test in Physics subject, Momentum and Impulse 15 items.

Data Collection

In the data collection part, there are the steps as follows.

Qualitative Data Collection

The tool for collecting is the test in Physics subject, Momentum and Impulse by using it in the post-test for 10 graders (46 people).

Data Analyzing

Qualitative Data Analyzing using the record from learning behavior and learning achievement to analyze, comment, brainstorm, and debate in term of narration to be a guide for improving the learning process.

Quantitative Data Analyzing use the record from learning achievement to analyze in arithmetic means and percentage.

Conclusion

From the using of CIPPA Model in Physics learning, Momentum and Impulse, it can be concluded as follows.

.1The Review of Background Knowledge

The teachers reviewed students' knowledge by using the technique that could make all students interested, ready to study, and to get new knowledge. Moreover, the teachers tried to let all students to participate in the process to have enough basic knowledge to study.

.2The Researching of New Knowledge

The teachers described all students about the learning process, by expected that the students will researched the information by themselves. However, the teachers always give the suggestions for all students about the data resources along with let them learn how to research everything by themselves.

3. The Learning of New Knowledge Linking with Old Knowledge

The teachers used the thinking process and group process to make all students tried to understand and tried to link the new knowledge with the old and along with always giving them the suggestions.

.4The Exchange of the Knowledge within Group

The teachers let all students talking in group and send the representative of the group to speak in front of the class, which allows the students to exchange their opinions together, recheck the understanding within group, and courage to speak along with teacher always give them the suggestions.

.5The Summarizing and Organizing of the Knowledge

After the students have brainstormed within group, teachers and students had debate and exchange the opinion together and organized all knowledge. However, teachers always support and give the suggestions to all students in term of summarizing and organizing.

.6The Display of the product

After the class, the students will have the product/works that each people in group help each other to create it. The teachers let them show their works in front of the class by using different techniques such as sing a song or the poem. Therefore, the students were really enjoyed and they can show their creativity as much as they can do.

.7The Applying of the Knowledge

In this step, the teachers focused on the using of the knowledge that all students have got to adapt it in each situation that the teachers give it to them. The teachers give the exercises to all students and then they need to brainstorm and try to solve the problem. Therefore, this can show that all students can adapt their knowledge to use it in their life beneficially.

In addition, the researchers would like to present the conclusion on the concept of learning activities by focusing on learners based on CIPPA Model with the expected to develop all students by allow them to participate in term of physically, intellectually, socially and emotionally, we propose the following findings:

The Constructing of Knowledge The students knew how to construct the knowledge since they were in the step of reviewing the background knowledge by commenting in the debating of background knowledge activity. Then, in the step of researching for new knowledge, the teachers allow all students to research from the data resources and create some activity that related to the step. After that, the students tried to understand the data that each group members researched and tried to link the new knowledge with the old one. Then, teachers let all students exchanged, analyzed, and organized the knowledge in different ways. From all steps that mentioned above, all students can create their own thinking process by using their group members to recheck their knowledge together.

The Interaction All students have an interaction with their group members and teachers by focused on more interaction with the environment. In this activity, all students can brainstorm, comment, and exchange their opinion with their friends along with joining the activities together. Therefore, the students could summarize and organize the knowledge by debating with friends and creating the product/work to show in front of the class. Moreover, in the adaptation step, the teachers let all students to participate in exercise competition.

Physical Participation In the researching step, all students participated in learning activity and then, in the displaying of the product step, the teacher allows all students to do their best to show in different ways such as acting in physical and voice. In the adaptation step, the teachers let all students to participate in exercise competition and show the solution in front of the class.

Process Learning The students learnt how to use the skills in every process since the researching process, which they used researching skill, thinking skills in the step of understanding old and new knowledge, exchanging skills in group process, and problem solving skills in the step of adapting knowledge.

Application All students can apply their knowledge into the exercise that teachers prepared for them and all members in group have to brainstorm while doing the exercise to get an accurate answer. The teachers use the exercise competition because they want to encourage all students to be more interested in learning process.

After observing the learning achievement, the result shows that 10 graders have the average point at 10.08 from the total score of 15 points. 60% of the students have passed the goal (30 people) or 65.22% of the total number of students.

Suggestions

From using CIPPA Model in learning activity, there are some suggestions from the researchers as follows.

.1General Suggestions

1.1Before the activity starts, the teachers should describe the students about the role of participating in the activity

1.2 In the learning activity, the students should participate in every process to improve their skills.

1.3 The teachers should support and suggest the students about the data resources for practicing them to research the information by themselves.

1.4The teachers should set appropriate time of each activity to ley all students get fully of quality learning process.

1.5A good learning atmosphere may help all students to feel relax to study and reduce their stresses.

.2The Suggestions for the Next Research

2.1Should prepare other teaching processes to join with CIPPA Model teaching process such as using TGT Technique, which use the competition in teaching process. In other words, in adapting step, there is the competition between all students to make them feel interested to study.

2.2Should use CIPPA Model teaching process with other subjects and different student grades to observe the results of using CIPPA Model in those subject. Moreover, the information can be used to benefit in other learning process.

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Needs Analysis of Generic Skills on Engineering Students for Work Preparation

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Abstract

The purposes of this study were 1) to investigate the necessity knowledge of engineering students for work preparation; 2) to study needs of English skills for work preparation; and 3) to study supplemental opinions and suggestions. The population of this research was 220 engineering students enrolled in English for Communication 3 Course in 2016 academic year. The samples of this research were the 140 engineering students derived through Simple Random Sampling technique. The instrument used in this study was rating-scale and open-ended questionnaire. The statistical values were the frequency, percentage, mean, standard deviation and content analysis. The results from the study will be used as a guideline to improve teaching-learning process, teaching materials and teaching activities in the future.

Keywords: *English Teaching-Learning Process, Generic Skills in EFL Classroom, Teaching English for Engineering Students*

Introduction

Generic skills are originally from Australia as a set of skills that are transferable within the Australian workforce (Chiswick et al., 2002). They are also known by many other terms such as soft skills, key skills, common skills, essential skills, employability skills, basic skills, necessary skills, competency skills, and transferable skills (Yassin and Hasan, 2008).

According to Nabi (2003), Generic skills are divided into three categories which are personal skills, communication skills and problem solving skills. In addition, McLoughlin and Luca (2000) note that Generic skills are formed into four management areas which are management of self, management of others, management of task, and management of information. This is supported by Crosbie (2005) who states that Generic skills are listed as collaboration, communication, initiative, leadership, personal development, personal effectiveness, planning and organizing, and presentation.

Luca and Oliver (2002), moreover, point out that teaching and learning process for Generic skill development as the need for learning environment that concerns on dialogue, feedback, reflection, and task-oriented activities. Thus, learning activities are needed to be situated in a contextual environment as in a 'real-world activity'.

In brief, it might be concluded that the main concepts of Generic skills are to focus on the development of technical ability, knowledge and qualifications. These principles are used in the design of learning activities that are integrated into a course that is delivered in learning tasks, learning supports and learning resources. As a result, the outcomes of this learning technique might assist in a development of TNI students' English ability and career advancement.

Research Purpose

The purposes of this study were

1) to investigate the necessity knowledge of engineering students for work preparation;

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2) to study needs of English skills for work preparation; and
3) to study supplemental opinions and suggestions.

Research Methodology

Population and Samples

Population of this study were 220 engineering students in the second semester of 2016 academic year at Thai-Nichi Institute of Technology.

Samples in this study were 140 fourth-year TNI students in the second semester of 2016 academic year derived through simple random sampling technique.

Instrumentation

The instrument used in this study was a questionnaire based on needs analysis of Generic skills on engineering students for work preparation.

The first part (Part 1) of this questionnaire asked for the demographic information on the students' gender. The second part (Part 2) concerned a study of needs analysis of Generic skills on engineering students for work preparation. This part comprised 40 items of a study of needs analysis of Generic skills on engineering students for work preparation in three major skills: 4 items of Basic Skills; 10 items of Conceptual skills; and 26 items of Personal Skills; The five levels of opinion used in the questionnaire were ranked as "The highest needs", "High Needs", "Moderate needs", "Low needs" and "The lowest needs". Responses from the student questionnaires were subsequently coded. The data of the students' coded responses were statistically calculated and analysed. The computation of Cronbach's Alpha as a measure of reliability was employed to indicate hoe reliable the research questionnaire results were. Reliability was defined as the proportion of the students' responses to each item in the questionnaire and the reliability coefficient or calculated alpha was a lower bound of the true reliability of the research instrument, or the questionnaire. The descriptive statistics was also used to determine the individual summary statistics for each of the 40 items in the questionnaire.

The third part (Part 3) asked for more opinions and suggestions of needs analysis of Generic skills on engineering students for work preparation based on open-ended questions.

Data collection

Needs analysis of Generic skills on engineering students for work preparation were accessed through the questionnaire in the second semester of 2016 academic year.

The administration of the research questionnaire was conducted in English classes. Part 1 concerns the demographic variables about the students' gender. The 40 items of Part 2 covered needs analysis of Generic skills on engineering students for work preparation in three major skills. Therefore, the participants were requested to consider each item carefully and indicate how important each item was for their study. A total of 140 engineering students completed the questionnaire. The students' responses from the questionnaire were subsequently coded using computer program as follows: "1 = male and 2=female" for genders; and "1=the lowest needs, 2 =low needs, 3 = moderate needs, 4 = high needs, 5 = the highest needs" for each of the five levels of importance on 40 items in Part 2.

The analyses of the research data were conducted by means of descriptive statistics. The descriptive statistical analyses of the frequencies and percentages of the students' responses were employed to report their demographic variables and to indicate the rank order of the items in each area of needs analysis of Generic skills on engineering students for work preparation listed in the questionnaire. The frequency distributions were analysed to determine the proportions of the students' responses to the five levels of importance on the 40 items in three major skills: 4 items of Basic Skills; 10 items of Conceptual skills; and 26

items of Personal Skills. Process analysis was conducted with the second research question in determining the associations of the participants' needs analysis of Generic skills on engineering students for work preparation to each of these demographic variables.

Data Analysis

Data analysis from questionnaire both single item and whole questionnaire which presented a form of rating scale. These rating scales were calculated to find out mean and standard deviation and then translated based on criteria developed by Best (1981) as follows:

1.00 <= < 1.50 refers to students had the lowest needs.
1.51 <= < 2.50 refers to students had low needs.
2.51 <= < 3.50 refers to students had moderate needs.
3.51 <= < 4.50 refers to students had high needs.
4.51 <= < 5.00 refers to students had the highest needs.

The collected data was analysed using computer program. The statistics used for analysing the data were frequency, percentage, mean, standard deviation, and content analysis.

Results

Phase 1: The results of demographic data

The analysis of the data from the students' questionnaire was presented in the first section deals with the demographic variables from the students' responses to Part 1 of the questionnaire in the following table.

Table 1: Table of the results of demographic data of respondents

Demographic data of respondents	**n=140**	**Percentage**
Gender		
1.1 Male	77	55
1.2 Female	63	45
Total	**140**	**100**

The table showed that percentages of engineering students in gender ranged from 55% for male students and 45% for female students.

Phase 2: Needs analysis of Generic skills on engineering students for work preparation

Table 2: Table of Mean ($\bar{x}$) and Standard Deviation (S.D.) of needs analysis of Generic skills on engineering students for work preparation in overall

No.	**Cluster**	$\bar{x}$	**S.D.**	**Level**
1.	Basic Skills	4.59	0.52	The highest
2.	Conceptual Skills	4.50	0.58	High
3.	Personal Skills	4.25	0.52	High
Total		**4.44**	**0.61**	**High**

The above table presented that the overall mean score of needs analysis of Generic skills on engineering students for work preparation was at high level

($\bar{x}$=4.44). The highest cluster was at Basic Skills ($\bar{x}$=4.59), followed by Conceptual Skills ($\bar{x}$=4.50) and Personal Skills ($\bar{x}$=4.25).

Table 3: Table of Mean ($\bar{x}$) and Standard Deviation (S.D.) of Needs analysis of Generic skills on engineering students for work preparation in Basic Skills

No.	Basic Skills	$\bar{x}$	S.D.	Level
1.	Literacy	4.82	0.66	The highest
2.	Numeracy	4.33	0.63	High
3.	Use of Technology	4.88	0.75	The highest
4.	Administration	4.35	0.79	High
Total		**4.59**	**0.77**	**The highest**

The above table presented that the mean score of needs analysis of Generic skills on engineering students for work preparation on Basic Skills was at the highest level ($\bar{x}$=4.59). The highest skill was at Use of Technology ($\bar{x}$=4.88) and Literacy ($\bar{x}$=4.82), followed by Administration ($\bar{x}$=4.35) and Numeracy ($\bar{x}$=4.33).

Table 4: Table of Mean ($\bar{x}$) and Standard Deviation (S.D.) of Needs analysis of Generic skills on engineering students for work preparation in Conceptual Skills

No.	Conceptual Skills	$\bar{x}$	S.D.	Level
1.	Reasoning	4.77	0.83	The highest
2.	Planning	4.81	0.84	The highest
3.	Being Creative	4.88	0.78	The highest
4.	Decision-Making	4.39	0.88	High
5.	Problem-Solving	4.56	0.87	The highest
6.	Adaptability	4.29	0.58	High
7.	Information/Resource Management	4.44	0.62	High
8.	Pursuit of Lifelong Learning	4.41	0.68	High
9.	Memorising	4.32	0.70	High
10.	Ensuring Accuracy	4.19	0.64	High
Total		**4.50**	**0.55**	**High**

The above table presented that the mean score of needs analysis of Generic skills on engineering students for work preparation on Conceptual Skills was at high level ($\bar{x}$=4.50). The highest needs of conceptual skill was at Being Creative ($\bar{x}$=4.88), followed by Planning ($\bar{x}$=4.81). The lowest needs at high level was Ensuring Accuracy ($\bar{x}$=4.19).

Table 5: Table of Mean ($\bar{x}$) and Standard Deviation (S.D.) of Needs analysis of Generic skills on engineering students for work preparation in Personal Skills

No.	Personal Skills	$\bar{x}$	S.D.	Level
1.	Self-Confidence	4.81	0.61	The highest
2.	Self-Management	4.39	0.65	High
3.	Self-Awareness	4.41	0.69	High
4.	Responsibility/Reliability	4.75	0.56	The highest
5.	Professionalism	4.22	0.58	High
6.	Values/Ethics	4.69	0.61	The highest

7.	Motivation	4.51	0.70	The highest
8.	Initiative	4.31	0.64	High
9.	Ability to Work Independently	4.33	0.63	High
10.	Ability to Manage Stress	4.45	0.58	High
11.	Promoting Skills	4.21	0.56	High
12.	Curiosity	3.81	**0.64**	High
13.	Practicality	4.12	0.62	High
14.	Judgement	4.77	0.61	The highest
15.	Sensitivity	4.27	0.71	High
16.	Cooperative Attitude	4.33	0.55	High
17.	Commitment	3.81	0.68	High
18.	Efficiency	4.22	0.58	High
19.	Achievement Orientation	4.27	0.72	High
20.	Ambition	3.32	0.71	High
21.	Enthusiasm	4.36	0.78	High
22.	Maturity	3.79	0.64	High
23.	Integrity	3.99	0.56	High
24.	Persuasiveness	3.98	0.76	High
25.	Balanced Attitude to Work and Home	4.22	0.75	High
26.	Work Ethic	4.18	0.59	High
Total		**4.25**	**0.54**	**High**

The above table presented that the mean score of needs analysis of Generic skills on engineering students for work preparation on Conceptual Skills was at high level ($\bar{x}$=4.25). The highest needs of conceptual skill was at Self-Confidence ($\bar{x}$=4.81), followed by Responsibility/Reliability ($\bar{x}$=4.75). The lowest needs at high level was Ambition ($\bar{x}$=3.32).

Phase 3: Suggestion from the respondents

The suggestions from the respondents were listed as follows:

1. Communication and Presentation Skills should be highlighted as the students should have a chance to practice these skills in the real situation setting.
2. Activities or projects based on a real industry setting are important.
3. Teaching English and Japanese languages in a real context is important.

Conclusion

1. The overall mean score of needs analysis of Generic skills on engineering students for work preparation was at high level ($\bar{x}$=4.44). The highest cluster was at Basic Skills ($\bar{x}$=4.59), followed by Conceptual Skills ($\bar{x}$=4.50) and Personal Skills ($\bar{x}$=4.25).

2. The mean score of needs analysis of Generic skills on engineering students for work preparation on Basic Skills was at the highest level ($\bar{x}$=4.59). The highest skill was at Use of Technology ($\bar{x}$=4.88) and Literacy ($\bar{x}$=4.82), followed by Administration ($\bar{x}$=4.35) and Numeracy ($\bar{x}$=4.33).

3. The mean score of needs analysis of Generic skills on engineering students for work preparation on Conceptual Skills was at high level ($\bar{x}$=4.50). The highest needs of conceptual skill was at Being Creative ($\bar{x}$=4.88), followed by Planning ($\bar{x}$=4.81). The lowest needs at high level was Ensuring Accuracy ($\bar{x}$=4.19).

4. The mean score of needs analysis of Generic skills on engineering students for work preparation on Conceptual Skills was at high level ($\bar{x}$=4.25). The highest needs of

conceptual skill was at Self-Confidence ($\bar{x}$=4.81), followed by Responsibility/Reliability ($\bar{x}$=4.75). The lowest needs at high level was Ambition ($\bar{x}$=3.32).

5. The suggestions from the respondents were listed as: Communication and Presentation Skills should be highlighted as the students should have a chance to practice these skills in the real situation setting; Activities or projects based on a real industry setting are important; and Teaching English and Japanese languages in a real context is important.

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Promoting Analytical Thinking Skill in Science Learning and Teaching

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Abstract

Usually, Thai parents and students aim to get high learning achievement scores. Nonetheless, 21st century instruction and learning require students not to acquire only knowledge but also skills and certain attributes. Also, the students are required to have analytical thinking skill. Thus, the purpose of this study was to investigating the fourth grade students' analytical thinking skill by using Inquiry Cycle method with Lesson Study in Science subject. The target group comprised 48 grade 4 students. The data were collected through analytical thinking skill assessment test, including 10 multiple-choice questions. The findings revealed that the students' average scores on analytical thinking skill were 64.03.

Keywords: *Analytical thinking, Inquiry, Science Teaching*

Introduction

Currently, the advancement of science and technology influences the changes of economy and society around the world. Education is a vital tool to develop the residents and respond to the changing era. Educating for the 21st century; therefore, requires a complete change of perspective from the traditional paradigm of education to a system which puts the child and the child's world and reality at the centre of the learning process. It goes beyond the simple acquisition of knowledge to a central focus on developing skills and attitudes' thinking skills, problem solving skills, organizational skills, and positive attitudes, self-esteem, innovation, creativity, communication skills, technological skills and of course values, self-confidence, resilience, self-motivation and environmental awareness. Above all, the ability to handle knowledge effectively in order to use it creatively is vital to the skills needed by the 21st Century students. (St George's College, n.d.)

However, the educational system in Thailand does not seem to respond to the needs of the individual, the society, and the nation. Most classes are based on contents. The students attempt to find ways only to get high scores on the tests. They go to tutorial schools to boost up their test scores rather than focus on the learning processes (Klainin, 2012). As shown in PISA 2015 ranking (Program for International Student Assessment, a survey to explain the scientific circumstances, to create and assess the inquiry processes, and to interpret the data and employ the scientific witnesses), it was found that the highest and the lowest scores were manifested in interpreting the data and employing the scientific witnesses (39.10%) and creating and assessing the inquiry processes (33.20%), respectively (PISA, 2012). Thus, the national educational system should be urgently improved in order to develop the quality of the nation's economy.

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Nowadays, the learning and teaching arrangement is transformed from teachers' knowledge transferring to children center. The students learn by doing and practicing as well as develop their thinking skill through searching for knowledge by themselves. This transformation enables the students to plan and evaluate their own learning. Additionally, the students are allowed to get access to various learning resources such as teachers, technology, parents, local wisdoms, and other related persons and resources. The above mentioned learning approach is relevant to Inquiry Cycle 5Es which is one of the knowledge inquiry techniques. It contains five main cycles, including, Exploration Engagement, Explanation, Elaboration, and Evaluation. These 5 cycles enhance the students' thinking skill and creativity. The students must link the current contents to their prior background knowledge in order to gain new knowledge. The IPST (2007) defined the Inquiry Cycle as an approach that the students need to inquire, explore, and search for knowledge by using several ways until they meaningfully understand and acquire the particular topic and are able to create their own learning concept by themselves. This way will contribute to the students' long-term memory and be able to apple the knowledge in real-life situations.

To design Science curriculum for Thai students, teachers must facilitate the students to learn and gain knowledge by themselves. Self-directed learning occurs when the students are allowed to get involved in all learning processes and participate in a variety of activities as an individual work and a group work. The learning resources should be locally and internationally accessed. The teachers' roles are to plan the lessons, stimulate the students' attention, and give advice to the students (the Academic Department of the Science and Technology Organization of the Ministry of Education, 2001). Thus, Science classes should allow students to employ different scientific processes to search for knowledge and create their own learning concepts. These teaching principles are related to the Inquiry Cycle; hence, the researcher was interested to develop the students' analytical thinking skill through Inquiry Cycle 5Es and design the lessons through Lesson Study approach so as to use the research results to improve Science learning and teaching for the 21st Century.

Methods

This research study is an applied research which employs a pre-experimental design with one group post-test design (One shot case study). The target group was 78 grade 4 students who were studying in the first semester of the Academic year 2016 at Demonstration School of Khon Kaen University. The variables studied in this research comprised 1) independent variable which is Inquiry Cycle 5Es together with Lesson Study for grade 4 students on the topic *Light* and 2) dependent variable which is the students' analytical thinking skill scores. The instruments included 1) lesson plans implemented Inquiry 5Es Cycle together with Lesson Study (5Es including 1. engagement 2. exploration 3. explanation 4. elaboration and 5. evaluation) and 2) the analytical thinking skill test containing 10 multiple choice questions on three main thinking analysis: analyzing the components, the relation, and the principles. The test was taken after implementing the innovations and then computed to find out percentage, mean, and standard deviation.

Results

The following table elucidates the results of grade 4 students' post-test scores on analytical thinking skill by implementing five steps of Inquiry Cycle method with Lesson Study.

Table 1 Students' analytical thinking scores

Test	Number of the students	Full score	Mean	Percentage	S.D.
Post-test	78	10	6.40	64.03	1.52

According to Table 1, the fourth grade students learned by Inquiry Instruction together with Lesson Study had the average scores of 64.03 which were ranked in a moderate level. The average percentage of students who could analyze the components, the relations, and the principles correctly were 81.39, 49.68, and 64.50 respectively. Furthermore, the standard deviation (S.D.) score was 1.52 which showed that the students' individual scores were slightly deviated from the common score most students gained. This revealed that there was a minimal difference between the highest and the lowest scores. Hence, the students' analytical thinking scores were averagely 6.4 out of 10.

Discussion

After investigating the fourth grade students' analytical thinking skill on the topic *Light* in Science subject by using Inquiry Cycle method with Lesson Study, it was found that the students' analytical thinking scores were averagely 64.03. The results could be attributed to students' analytical thinking practices through Inquiry Cycle method together with Lesson Study. Through the implemented innovations, the students practiced observing, collecting data, sharing their opinions, analyzing the data, and making consideration about things surrounding them. Consequently, the students gained analytical thinking skill. The findings are relevant to the studies conducted by several researchers: Saunders-Stewart, Gyles and Shore (2012) who investigated the student outcomes in Inquiry Instruction, and Walker and Shore (2015) who studied the classroom roles in Inquiry Education. These showed that Inquiry has a great impact on the students' roles. Additionally, Lesson Study is also a great tool for developing the lessons to be suitable with the classroom environment and improving the teachers' teaching performance. This finding was also proved by the studies done by Akiba and Wilkinson (2012), Hallås (2015), and Roberts, Benedict, Kim, and Tandy (2017).

Recommendations

1. The students will be motivated to learn more if the designed activity in the engagement stage is related to the students' experiences.

2. Some grade 4 students are not responsible for investigating the processes of the learning activities on their own, so the teacher should get the students to study the experimental pattern as a whole class activity during the exploration stage.

3. The exploration stage is important and contributes to students' knowledge conclusion. The teacher, then, should allocate enough time for the students to think and share ideas. Moreover, questioning the students can also help activate the students' great ideas.

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A Study of Students' Mathematical Communication Competence in Classroom Using Open Approach

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Abstract

This research aims to explore the mathematical communication competence in classroom using open approach as qualitative research, Protocol Analysis and Analysis Description. The target samples of this research are 6 students from 3 grade of Baan Ma-Aue School, Roi-Et Province, under the management of the Students' Mathematical Higher Thinking Development Project in Northeastern of Thailand, the Centre for Research in Mathematics Education (CRME), Khon Kean University. The researcher analyzed theses following data: Protocol data from sound and video recorder(s) interpretation, pictures, students' works and field notes recording forms according to Dan (2013).

The result shows that, the classroom using open approach according to Inprasitha (2011) in the first procedure, posing open-ended problem students have the potential to do the mathematical communication in the 2st level which is Connection and Transformation. Students communicated through speaking and writing to express their opinions, explain or clarify their concepts to the others in order to be conjunctive comprehension. Students applied their previous knowledge to solve any new problems and could translate or interpret the mathematical sentences into the representation forms like; letters, symbols or mathematical marks. The second: students' self-study, third step: whole class discussion and comparison and fourth step: summarization through connection students' mathematical ideas emerged in the classroom. Students could have the mathematical competence through the 3rd level: Reflection and Extension, they communicated through speaking and writing to express their opinions. They checked self-problems solving and found self-problems solving progressive method and summarized as rules or formulas which can be used to solve the other problems.

Keywords: *Mathematical Communication, Mathematical Competence, Mathematical Communication Competence, Open Approach*

Introduction

The Mathematical Communication Competence is the factor that changes the international mathematical courses direction (NCTM, 1989) through the competence assessment. In term of students' mathematical communication competence, we should emphasize to the mathematical ideas presentation in forms of symbols, words, diagrams, graphs or data through tables (Shield et al., 1989). Thailand's Ministry of Education (2008) defined the mathematical communication standard for grade 1-6 secondary education to use mathematical language and marks to communicate and to be appropriate presentation satisfies with Niss (2003) to make mathematical communication competence will be included the others' mathematical sentences comprehension and writing, speaking or visual expressions and to educate students how to be a good communicator. "Teachers should

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activate students within the classroom society in order to let give them the freedom to express the ideas sincerely and openly without any frights" (NCTM, 2000).

Inprasitha (2003) presented the Open Approach innovation, new teaching method which focuses on individual diversity especially in thinking thus, teachers have to comprehend the students' ideas at most, give them some thinking opportunities to negotiate the meanings with the other students that aims to let students have learning aspects, problem solving methods and various answering. Furthermore, Inprasitha (2011) informed that, an open approach is the teaching method which focuses on students' learning aspects, problems solving methods, various answering, open-minded to study, freedom thinking and different opinions expression opportunity. The aspect of an open approach classroom focuses on mathematical discussion and communication (Nohda, 2000, cited on Thinwiangthong, 2012). The mathematical communication Competence was divided into 3 levels: 1st level, Recall and Imitation, 2nd level, Connection and Transformation and 3rd level, Reflection and Extension (Dan, 2013).

As the mentioned above, the researcher emphasized about the necessity of mathematical communication thus, the researcher studied about mathematical communication competence the students who studied in the atmosphere of open approach classrooms in Thailand like; how to competence students mathematical communication as the advantage of students' mathematical communication competence development and improve the further teachers' learning activities.

Research purpose

To explore students' mathematical communication competence in classroom using open approach

Terminology

1) Mathematical Communication is the behaviour expression through speaking, writing, thinking and illustration to represent students' mathematical ideas in forms of vocabularies, symbols or mathematical structures.

2) Mathematical Communication Competence is mathematical facts comprehension, presentation, thinking and idea competence. The mathematical communication competence of Dan (2013) was divided into 3 levels:

2.1) 1st level: Recall and Imitation is simple sentences identification and selection competence in forms of oral speaking or writeable to express summarized mathematical comprehension.

2.2) 2nd level: Connection and Transformation is mathematical sentences identification and selection to translate or interpret these sentences into representation forms like; graphs, letters and symbols and show explanation and justification to support self-problems solving methods and the others.

2.3) 3rd level: Reflection and Extension is complex mathematical sentences identification and selection to show self-integrated problems solving methods in appropriate and flexible representation forms and could evaluate self-mathematical comprehension and the others in term of argumentation.

3) Open Approach is the learning management guideline which focuses on students' mathematical activities with open-ended problem using and let students do self-study method with an open approach according to Inprasitha (2011), included 4 steps: 1) Posing open-ended problems, 2) Students' self-learning, 3) whole class discussion and comparison and, 4) Summarization through connecting students' mathematical ideas emerged in the classroom.

Research methodology

1) Target group

The target group of this research is 6 students from 3 grade of Baan Ma-Aue School, Roi-Et Province, the data was collected during the first semester of 2016 academic year. This school has attended the Students' Mathematical Higher Thinking Development Project in Northeastern of Thailand, the Centre for Research in Mathematics Education (CRME), Khon Kean University since 2013. The target students were selected based on open-ended problems situation familiarity in order to cooperate, exchange open-ended problems opinions exchange, encourage the problems-solve speaking and writable.

2) Research tools

2.1) the data collection tools are: lesson plans, camera, videos recorder(s), sound recorder(s) and field notes.

2.2) the data analysis tools are: students' works, sound and video recorder(s) protocols and mathematical communication competence patterns, according to Dan (2013)'s framework.

3) Data collection

The researcher and assistant researcher team observed the 3 grade mathematical class of Baan Ma-Aue School, Roi-Et Province, to familiarize with students and teacher and plot the leaning management plans. In term of data collection, researcher and assistant researcher team would be the classroom observers to observe any students' behavior and recorded into field notes and also recorded slides and videos through the class ending. Teachers, researcher and assistant researcher team would not intervene in the students' ideas during the problems solving process.

4) Data analysis

This research data analysis is a qualitative pattern which focuses on Protocol Analysis and Analytic Description. The researcher collected the data through video, sound and slide recorders to analyze the data according to Inprasitha (2011)'s framework and mathematical communication competence of Dan (2013)'s framework.

Conclusion

After considered students' mathematical communication competence in classroom using open approach according to Inprasitha (2001)'s framework and mathematical communication competence of Dan (2013)'s framework, the researcher concluded the data analysis result in the following tables:

Data analysis summarization table

Open Approach	**1st step: Posing open-ended problems**			**2nd step: students' self-learning**			**3rd step: Whole class discussion and comparison**			**3rd step: Summarization through connection students' mathematical ideas emerged in the classroom**		
Mathematical Communication Competence / Plan	**1st Level**	**2nd Level**	**3rd Level**	**1st Level**	**2nd Level**	**3rd Level**	**1st Level**	**2nd Level**	**3rd Level**	**1st Level**	**2nd Level**	**3rd Level**
Plan 1	✓			✓				✓				✓
Plan 2	✓				✓				✓			✓
Plan 3		✓				✓		✓				✓
Plan 4	✓				✓			✓				✓
Plan 5	✓				✓			✓				✓
Plan 6	✓				✓			✓				✓

Table 1: this table illustrates the result of mathematical communication competence in classrooms using open approach from 1-6 lesson plans.

Remark:

✓ Means students' mathematical communication competence in classroom using open approach was appeared.
1st level is Recall and Imitation
2nd level is Connection and Transformation
3rd level is Reflection and Extension

From table 1 we can include the data analysis results as follows:

1. The mathematical communication competence of open approach class students, the 1st level: Recall and Imitation found that, students could communicate through oral speaking to express their opinion and comprehension. Students read the sentences or orders out loud to repeat and selected or identified the requested data in form of summarization which could be found in 1, 2, 4, 5 and 6 lesson plans in the first step: posing open-ended problems and in the 1st lesson plan, second step: students' self-learning from open approach teaching class.

2. The mathematical communication competence of open approach class students, the 2nd level: Connection and Transformation found that, students could communicate through speaking and writing to express their opinion, explanation or justification their ideas to the others and in order to be conjunctive comprehension. Students applied their previous knowledge to solve new problems and could translate or interpret the messages into mathematical sentences in representation forms like; letters, symbols or mathematical

meanings that could be found in third lesson plan, first step: posing open-ended problems, 1, 2, 4, 5 and 6 lesson plans, second step: students' self-learning and in 1, 2, 4, 5 and 6 lesson plans, third step: whole class discussion and comparison of open approach teaching.

3. The mathematical communication competence of open approach class students, the 3rd level: Reflection and Extension found that, students could communicate through speaking and writing to express their ideas, do a re-check their self-problems solving methods, find the progressive self-problems solving methods and conclude into rules or regular formulas to be used for the other problems solving that could be found in third lesson plan, second step: students' self-learning, third step: whole class discussion and comparison and could be found in every lesson plans, fourth step: summarization through connection students' mathematical ideas emerged in the classroom with open approach.

Discussion

The results found that, Open Approach class activities according to idea of Inprasitha (2011), included 4 steps: first step; posing open-ended problems, second step; students' self-learning, third step; whole class discussion and comparison and fourth step; summarization through connection students' mathematical ideas emerged in the classroom found that, students have mathematical communication competence based on Dan (2013)'s framework in the highest level, third level. The first step; posing open-ended problems, students have mathematical communication competence through second level: Connection and Transformation. In terms of second step; students' self-learning, third step; whole class discussion and comparison and fourth step; summarization through connection students' mathematical ideas emerged in the classroom, students achieved the third level of mathematical communication competence, Reflection and Extension. In order that, lesson plans are necessity for mathematical communication competence in each level thus, some lesson plans could make students get higher mathematical communication competence level in open approach teaching method as we can see in the Table 1 that illustrates 2nd lesson plan, third step: whole class discussion and comparison, students could reach mathematical communication competence through third level and about third lesson plan, first step: posing open-ended problems, students could reach the second level of mathematical communication competence and second step; students' self-learning, students could reach the third level of mathematical communication competence. Besides lesson plans, teachers' teaching method is the another important factor that could let students achieve mathematical communication competence like; to activate the communication between teachers and students or students and teachers through opinions expression questionings to let students do some argumentation through conjunctive summarization. If the lesson plans are improved or created, students should be more given an opportunity to communicate in the first step: posing open-ended problems. Students might achieve the highest level of mathematical communication competence, 3rd level but in Thailand, teachers usually apply the narrative or demonstrative explanation and conclude any rules and theories to students. Therefore, most students will study through recitation (Ithirot, 2001). About mathematics teaching that often focuses on recitation, students might deficient in intuitiveness thinking and rational analysis (Runcharoen, 2002). Thus, to support mathematical communication between teachers and students or students and teachers through open approach according to Inprasitha (2001)'s framework will let students do their self-learning, encourage to think and have more self-confident in addition, students could explain or justify their ideas to recognize and comprehend the others.

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Turning Up the Heat in South African Education

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Abstract

The plight of education in South Africa is of grave concern for those educators who are passionate about transferring knowledge, skills and values. Learners are not performing at expected levels, nor are they able to reach educational outcomes that are being prescribed. This situation is exacerbated by learners who are not committed to achieving educational outcomes and educators who are ill prepared for the classroom situation. Moreover, learners in South Africa who participated in International Assessments are among the worst performing. Despite various intervention strategies to improve education in South Africa there seems to be a downward spiral in the quality of education being provided and this gap is especially evident in first time entering students at universities, who are either suspending their studies because they cannot cope or they do not complete their studies in the minimum time allocated for diploma or degree qualifications. This investigation provides a critique of initiatives that have been implemented to improve the education crisis and provide recommendations that could assist in remedying this quandary. A qualitative approach has been used to obtain data. Interviews were used as a data-gathering instrument to ascertain the views of stakeholders in education regarding learner achievement and why educators are not adequately prepared to assist learners to achieve educational outcomes. This investigation has been augmented with a review of relevant literature pertaining to the calamity in education in South Africa. The results indicate that many educators and subject specialists are in agreement that educators are indeed ill prepared, learners lack motivation and commitment to their studies, access to educational resources are limited and a number of other factors impact negatively on education in South Africa.

Keywords: assessment, educational outcomes, intervention strategies

Introduction

In South Africa the educational system has seen many changes over the past 20 years. The transformation agenda was introduced to correct imbalances of the previous South African educational system. A system that was characterized by segregated and unequal opportunities for learners. The new educational system was implemented to improve learner performance, especially for those learners coming from previously disadvantaged communities and low socio-economic backgrounds.

Despite the changes that have been introduced to correct previous inequities in education learners are still underperforming. Research conducted by (Dickson & Peak, 2008) reveals that the results of South African learners' participating in national and international assessments are cause for distress and concern. For example, in an international Reading Literacy study, South African Grade 4 and 5 learners achieved the lowest results out of 45

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educational systems. Moreover, South African learners who participated in similar international assessments did not show any marked improvement in their performance, nor did they perform as well as their international counterparts (Howie, Van Staden, Tshele, Dowse, & Zimmerman, 2011).

Despite overhauling the educational system and introducing an Outcomes Based Education Approach (OBE), it was found that learners in South African schools were still underperforming. According to (Van Rooyen, 2004), OBE is a learner-centred approach to teaching and learning but it did not succeed. This is corroborated by South African learners who participated in national as well as international assessments. For example, (Howie S. , 2005) found that South African learners who participated in the Third International Mathematics and Science Study (TIMSS) in 2012 performed amongst the worst of all participating countries. (Bloch, 2010) boldly asserts that between 60-80% of South African schools could be classified as being dysfunctional. This can be considered as being a real crisis in South African education. However, educators cannot be solely held responsible for the current education crisis, other education stakeholders such as learners, school governing bodies, parents and education authorities' are all responsible but especially educators who are directly involved with learners also continuously have to deal with learner disciplinary, which they neither know how to deal with, or to solve.

Literature review

According to (Robinson, 2007), learner achievement is the ability of a learner to succeed in an assessment and display a satisfactory level of competence. Similarly, (Taras, 2005) states that an assessment is a tool to determine learner achievement of educational outcomes at various stages. (Legotla, Maaga, & Sebego, 2002) investigated the reasons for underachievement in Grade 12 learners. They have found that the medium of instruction is problematic, especially for learners who are not adept in the Language of Learning and Teaching (LOLT). Similarly, (Uys, Van der Walt, Van den Berg, & Botha, 2007) point out that a large percentage of learners in South Africa receive instruction in a language, which is English, not their mother tongue. Moreover, (Rosenthal, Baker, & Ginsburg, 1983) have also found that the medium of instruction does significantly affect learner achievement.

According to (Kashula, 2013), English and Afrikaans are languages of academia and students at universities who do not have these languages as their mother tongue should be assisted to reach a level of academic proficiency in either English or Afrikaans. This should assist these students to be successful in their respective academic careers. However, in order for this process to be successful it should actually be implemented at basic education, more specifically, during the Foundation Phase, long before learners enter university. In layman's terms this means equipping students with reading and writing skills that allow them to communicate with understanding and comprehension, which should be a requisite at school. In addition, the researcher believes that the language problem is compounded when learners emanate from poor socio-economic backgrounds and are being discriminated against because of their ethnicity. Therefore, learners fail to perform at acceptable levels because the LOLT is a barrier that deters them from achieving educational outcomes.

The Annual National Assessment (ANA) programme was implemented to provide educators with guidance regarding learning outcomes, ensure the equal distribution of resources, implement effective co-ordination of learning activities, enhance education and

provide key stakeholders with information regarding shortcomings in the educational system but has only has only achieved minimal success (Education, Report on the Annual National Assessments, 2011). There are still educators who have not been properly trained, especially those situated in rural areas. Despite the provincial department of education attempting to co-ordinate learning activities it has only been partially successful. Poor communication has also been a central feature for the downward trend in education in South Africa and only what can be referred to as pockets of excellence have been created in previously advantaged and well-resourced schools. Underperforming schools are not performing at acceptable standards despite various educational interventions being initiated, which is disconcerting.

An analysis of the of the 2011 ANAs reveal that learner performance is disturbing and that learners are unable to obtain achieved ratings in various learning areas. In 2011 the ANA average for Grade 6 learners in mathematics was 30% and for languages 28%. The results indicate that Grade 6 learners are underperforming, very similar to the results of grade 3 learners. The majority of Grade 6 learners who participated in the ANA were unable to obtain an achieved rating in either mathematics or languages. Furthermore, the performances of learners in the different provinces in South Africa reveals that provincial averages are between 205 and 41%. These results have provided insight into the standard of learners Literacy and Mathematics levels. In addition, there are still schools who are not adequately resourced, learning activities are not effectively planned and communication strategies to reach all educators are ineffective. Another initiative to improve learner performance is the Action Plan 2014, which is aimed at improving academic achievement (Education, Action Plan 2014, towards the realization of schooling 2025 , 2011) but this initiative has also only achieved limited success. Noteworthy, is that the learners who attend well-resourced schools perform better than their counterparts who attend school in poor socio-economic areas and where schools are under resourced.

Turning to the Senior Certificate examination and the results thereof in South Africa. This is a national assessment and provides successful learners with access to tertiary education. Many learners are able to meet the minimum requirements to receive Senior Certificates but find the transition from secondary to tertiary education extremely challenging and demanding. This has been observed by the researcher who lecturers at a University of Technology in South Africa.

In a South African context, it is generally accepted that many students enter university being underprepared for what is required of them, especially regarding Academic Literacy (AL) and Numeracy. Proactive universities are attempting to address this problem by implementing strategies to bridge the gap between Grade 12 and first-year university entrants. These bridging courses or compulsory core modules, such as AL are aimed at improving the overall success rate of first year students at universities. (Van Schalkwyk, Bitzer, & Van der Walt, 2009) explains that academic literacy acquisition and competence does not flow naturally from being exposed to “disciplinary discourse” (Van Schalkwyk, Bitzer, & Van der Walt, 2009). These academics agree that academic literacy modules with a discipline specific context are beneficial to students.

(Astleitner, 2005) has identified a number of instructional principles that could enhance classroom instruction such as focusing on the situation in which instruction occurs, providing learners with an opportunity to reflect on their own learning, using different instructional approaches as well as identifying learner strengths and weaknesses. Yet these educational initiatives need to be implemented effectively in order to achieve any desired

affect or improve leaner performance. (McLaucchlin, 2007) recommends that educators move away from outdated teaching practices and incorporate innovative teaching strategies to improve learner performance. This can however only be implemented where institutions of learning are adequately resourced.

According to (Fox, 2001), effective instructional strategies do improve learner achievement and the researcher concurs with Fox. (Alshare & Miller, 2009) state that educator competence and effectiveness during instruction are tantamount to the overall educational process. Similarly, (Hawking, 2005) postulates that educators play a critical role in fostering a classroom environment that is conducive to learning, that is, an environment in which learners have the freedom to express their opinions frankly and honestly.

Design/Procedure

A qualitative approach has been used to collect data. Interviews were used as a data-gathering instrument to ascertain the views of educators, subject specialists and lecturers on why education in South Africa is in a state of crisis. Subject specialists in Mathematics and English were targeted because these subjects are regarded as problem subjects. According to (Salkind N. , Exploring Research, 2009) an interview is an exchange of ideas and information between individuals on a topic that is of interest to all parties. This method has been used to gain insight into a specific area of knowledge, that is to understand why learners are underperforming and why they are not performing as well as their international counterparts. In depth open-ended interviews were used because the researcher wanted to obtain a comprehensive and all-inclusive understanding how participants feel about education in South Africa. This is also in line with how (Creswell, et al., 2007) explains qualitative research. Educators and lecturers have been specifically targeted to ascertain how education stakeholders in secondary and tertiary education perceive the challenges facing education in South Africa.

This investigation has been augmented with a review of relevant literature pertaining to the unfortunate situation regarding education in South Africa. The literature review plays a significant role in contextualizing a study and provides information as to why we are experiencing a crisis in education in South Africa. In other words, why we are experiencing an educational slump in South Africa and where to from here to improve upon the current situation.

Findings/Analysis

In this investigation the analysis of data included reading the transcripts of the interviews, organising the information and paraphrasing to illustrate the findings in a logical manner. The researcher analysed the information from educators, then subject specialists and finally lecturers.

Educators are frustrated because many have limited resources, classes are large, learners are not motivated, communication with relevant education stakeholders is often delayed. Educators assign these communication problems to their not receiving term workshop programmes on time, principals do not collect post from district offices, which results in educators receiving information too late. The appointments of educators are delayed, academic and curriculum changes do not reach educators on time, nor are there effective implementation plans. Educators also complain that compliance gaining is another challenge

that they have to deal with. Consequently, learners who do not pay attention or who are disruptive in class do not excel academically.

One of the major problems subject specialists from the DoE are grappling with is educator competence, especially in learning areas such as Mathematics and English. They have indicated that many educators are not able to assist learners because they are not adequately trained. Nor do these educators have information technology skills that could assist them to access information to improve their teaching methods. It is their view that competent educators should be able to assist learners but this is often not the case. In addition, the LOLT is also a problem because many educators are not proficient in English, which is the medium of instruction. Subject advisors indicated that they schedule cluster meetings with educators to inform them about curriculum matters and assessment but meetings are poorly attended. Many schools still do not have access to electronic mail or other advanced forms of technology.

Consequently, well-resourced schools are at an advantage because they receive information timeously. Conversely, under resourced schools have to rely on the pigeon hole system which has proved to be ineffective. Subject specialists also experience problems obtaining permission to visit schools. They are disillusioned by bureaucratic red tape that hinder them from doing their work. They are frustrated by the large number of schools' assigned to them. Consequently, they are often not able to visit schools regularly. They have also reported that communication problems include: roads that are inaccessible during rainy seasons, telephones that are not working and even network problems with schools that have internet access.

The researcher's interaction with lecturers has revealed that they believe that learners are not equipped with the necessary skills to access mainstream university programmes. One of the major problems highlighted is the medium of instruction. This coupled with the fact that many first year students are struggling with reading and writing. They have also indicated that students have difficulty comprehending prescribed texts and that their writing skills are not up not standard.

Recommendations

In order to improve education in South Africa resources for educators should be made available for them to be effective in the classroom. Large classes which is an age old problem should be reduced and more educators should be appointed to alleviate this problem. Appointments of educators should receive priority, parents, teachers and the community as well as school governing bodies should work together to create environments conducive to teaching and learning. In this way the basic problems that deter effective teaching and learning should be addressed.

The language policies at provincial and national level should be reviewed because learners should be provided with access to instruction in the language of their choice. There should be more accountability for educators who do not attend workshops or meetings arranged by subject specialists. Principals should take the lead and ensure that information from the DoE is received timeously and that educators attend these workshops. Communication between stakeholders such as educators, principals, subject specialists and circuit managers should be improved in order for it to be effective. This should enhance the

quality of education that learners receive. The number of schools assigned to subject advisors should be reduced in order for them to be more effective that they are at present. This should especially be implemented with subjects such as Mathematics and English where there is a major problem.

The researcher recommends that a link between Further Education and Training (FET) which focuses on grade 10-12 and Higher Education (HE) be established to ensure that educators and lecturers are informed about curriculum matters. All the educators who have been interviewed have indicated that they do not have profound knowledge of what is happening in the higher education sector. Similarly, lecturers have indicated that they are not acquainted with curricula in FET. Therefore, it appears as though the two groups are working in silos, which is not the ideal situation. This gap should be narrowed in order to improve the current education crisis.

Despite intervention strategies for first time entering university students, attrition rates are still too high. Students are also not completing degree and diploma courses in the allotted time frames. Collaboration between FET and HE could alleviate this problem and the gap between Grade 12 and first year university could be narrowed and more students could be successful and obtain qualifications in the prescribed time frames.

As the title of this article, *"Turning up the heat in South African education"* suggests it is time to address issues with new dynamism and vigour that will compel learners to perform to their very best. This applies to educators, subject specialists, school governing bodies, provincial and national education departments and other stakeholders directly and indirectly involved in education. More stringent measures should be implemented by provincial and national education authorities that will ensure that education stakeholders are held accountable for the success of education in South Africa. That being said, the researcher wishes to acknowledge the concerted efforts of many education stakeholders who are committed to improving the South African educational system. However, it is disconcerting to note the large number of first year students who simply drop out of university because they cannot cope, more so the number of learners at schools who do not even reach Grade 12.

This article once again reveals that the real issues such as resources, educator competence, LOLT, large classes, compliance gaining, communication, commitment and dedication are among the real issues that prevent educators, lecturers and even subject specialists from performing to the best of their ability. We are aware of these constraints but effective intervention is still lacking and should be remedied. Nor are the problems such as the medium of instruction in which learning occurs being taken seriously or addressed in a manner that fosters improvement in the educational fraternity.

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Investigation of First Year University Students' Interpretation of Graphs in Mathematics and Kinematics

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Abstract

The plight of education in South Africa is of grave concern for those educators who are passionate about transferring knowledge, skills and values. Learners are not performing at expected levels, nor are they able to reach educational outcomes that are being prescribed. This situation is exacerbated by learners who are not committed to achieving educational outcomes and educators who are ill prepared for the classroom situation. Moreover, learners in South Africa who participated in International Assessments are among the worst performing. Despite various intervention strategies to improve education in South Africa there seems to be a downward spiral in the quality of education being provided and this gap is especially evident in first time entering students at universities, who are either suspending their studies because they cannot cope or they do not complete their studies in the minimum time allocated for diploma or degree qualifications. This investigation provides a critique of initiatives that have been implemented to improve the education crisis and provide recommendations that could assist in remedying this quandary. A qualitative approach has been used to obtain data. Interviews were used as a data-gathering instrument to ascertain the views of stakeholders in education regarding learner achievement and why educators are not adequately prepared to assist learners to achieve educational outcomes. This investigation has been augmented with a review of relevant literature pertaining to the calamity in education in South Africa. The results indicate that many educators and subject specialists are in agreement that educators are indeed ill prepared, learners lack motivation and commitment to their studies, access to educational resources are limited and a number of other factors impact negatively on education in South Africa.

Keywords: assessment, educational outcomes, intervention strategies

Introduction

In South Africa the educational system has seen many changes over the past 20 years. The transformation agenda was introduced to correct imbalances of the previous South African educational system. A system that was characterized by segregated and unequal opportunities for learners. The new educational system was implemented to improve learner performance, especially for those learners coming from previously disadvantaged communities and low socio-economic backgrounds.

Despite the changes that have been introduced to correct previous inequities in education learners are still underperforming. Research conducted by (Dickson & Peak, 2008) reveals that the results of South African learners' participating in national and international assessments are cause for distress and concern. For example, in an international Reading Literacy study, South African Grade 4 and 5 learners achieved the lowest results out of 45

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educational systems. Moreover, South African learners who participated in similar international assessments did not show any marked improvement in their performance, nor did they perform as well as their international counterparts (Howie, Van Staden, Tshele, Dowse, & Zimmerman, 2011).

Despite overhauling the educational system and introducing an Outcomes Based Education Approach (OBE), it was found that learners in South African schools were still underperforming. According to (Van Rooyen, 2004), OBE is a learner-centred approach to teaching and learning but it did not succeed. This is corroborated by South African learners who participated in national as well as international assessments. For example, (Howie S. , 2005) found that South African learners who participated in the Third International Mathematics and Science Study (TIMSS) in 2012 performed amongst the worst of all participating countries. (Bloch, 2010) boldly asserts that between 60-80% of South African schools could be classified as being dysfunctional. This can be considered as being a real crisis in South African education. However, educators cannot be solely held responsible for the current education crisis, other education stakeholders such as learners, school governing bodies, parents and education authorities' are all responsible but especially educators who are directly involved with learners also continuously have to deal with learner disciplinary, which they neither know how to deal with, or to solve.

Literature review

According to (Robinson, 2007), learner achievement is the ability of a learner to succeed in an assessment and display a satisfactory level of competence. Similarly, (Taras, 2005) states that an assessment is a tool to determine learner achievement of educational outcomes at various stages. (Legotla, Maaga, & Sebego, 2002) investigated the reasons for underachievement in Grade 12 learners. They have found that the medium of instruction is problematic, especially for learners who are not adept in the Language of Learning and Teaching (LOLT). Similarly, (Uys, Van der Walt, Van den Berg, & Botha, 2007) point out that a large percentage of learners in South Africa receive instruction in a language, which is English, not their mother tongue. Moreover, (Rosenthal, Baker, & Ginsburg, 1983) have also found that the medium of instruction does significantly affect learner achievement.

According to (Kashula, 2013), English and Afrikaans are languages of academia and students at universities who do not have these languages as their mother tongue should be assisted to reach a level of academic proficiency in either English or Afrikaans. This should assist these students to be successful in their respective academic careers. However, in order for this process to be successful it should actually be implemented at basic education, more specifically, during the Foundation Phase, long before learners enter university. In layman's terms this means equipping students with reading and writing skills that allow them to communicate with understanding and comprehension, which should be a requisite at school. In addition, the researcher believes that the language problem is compounded when learners emanate from poor socio-economic backgrounds and are being discriminated against because of their ethnicity. Therefore, learners fail to perform at acceptable levels because the LOLT is a barrier that deters them from achieving educational outcomes.

The Annual National Assessment (ANA) programme was implemented to provide educators with guidance regarding learning outcomes, ensure the equal distribution of resources, implement effective co-ordination of learning activities, enhance education and provide key stakeholders with information regarding shortcomings in the educational system

but has only has only achieved minimal success (Education, Report on the Annual National Assessments, 2011). There are still educators who have not been properly trained, especially those situated in rural areas. Despite the provincial department of education attempting to co-ordinate learning activities it has only been partially successful. Poor communication has also been a central feature for the downward trend in education in South Africa and only what can be referred to as pockets of excellence have been created in previously advantaged and well-resourced schools. Underperforming schools are not performing at acceptable standards despite various educational interventions being initiated, which is disconcerting.

An analysis of the of the 2011 ANAs reveal that learner performance is disturbing and that learners are unable to obtain achieved ratings in various learning areas. In 2011 the ANA average for Grade 6 learners in mathematics was 30% and for languages 28%. The results indicate that Grade 6 learners are underperforming, very similar to the results of grade 3 learners. The majority of Grade 6 learners who participated in the ANA were unable to obtain an achieved rating in either mathematics or languages. Furthermore, the performances of learners in the different provinces in South Africa reveals that provincial averages are between 205 and 41%. These results have provided insight into the standard of learners Literacy and Mathematics levels. In addition, there are still schools who are not adequately resourced, learning activities are not effectively planned and communication strategies to reach all educators are ineffective. Another initiative to improve learner performance is the Action Plan 2014, which is aimed at improving academic achievement (Education, Action Plan 2014, towards the realization of schooling 2025 , 2011) but this initiative has also only achieved limited success. Noteworthy, is that the learners who attend well-resourced schools perform better than their counterparts who attend school in poor socio-economic areas and where schools are under resourced.

Turning to the Senior Certificate examination and the results thereof in South Africa. This is a national assessment and provides successful learners with access to tertiary education. Many learners are able to meet the minimum requirements to receive Senior Certificates but find the transition from secondary to tertiary education extremely challenging and demanding. This has been observed by the researcher who lecturers at a University of Technology in South Africa.

In a South African context, it is generally accepted that many students enter university being underprepared for what is required of them, especially regarding Academic Literacy (AL) and Numeracy. Proactive universities are attempting to address this problem by implementing strategies to bridge the gap between Grade 12 and first-year university entrants. These bridging courses or compulsory core modules, such as AL are aimed at improving the overall success rate of first year students at universities. (Van Schalkwyk, Bitzer, & Van der Walt, 2009) explains that academic literacy acquisition and competence does not flow naturally from being exposed to “disciplinary discourse” (Van Schalkwyk, Bitzer, & Van der Walt, 2009). These academics agree that academic literacy modules with a discipline specific context are beneficial to students.

(Astleitner, 2005) has identified a number of instructional principles that could enhance classroom instruction such as focusing on the situation in which instruction occurs, providing learners with an opportunity to reflect on their own learning, using different instructional approaches as well as identifying learner strengths and weaknesses. Yet these educational initiatives need to be implemented effectively in order to achieve any desired affect or improve leaner performance. (McLaucchlin, 2007) recommends that educators move

away from outdated teaching practices and incorporate innovative teaching strategies to improve learner performance. This can however only be implemented where institutions of learning are adequately resourced.

According to (Fox, 2001), effective instructional strategies do improve learner achievement and the researcher concurs with Fox. (Alshare & Miller, 2009) state that educator competence and effectiveness during instruction are tantamount to the overall educational process. Similarly, (Hawking, 2005) postulates that educators play a critical role in fostering a classroom environment that is conducive to learning, that is, an environment in which learners have the freedom to express their opinions frankly and honestly.

Design/Procedure

A qualitative approach has been used to collect data. Interviews were used as a data-gathering instrument to ascertain the views of educators, subject specialists and lecturers on why education in South Africa is in a state of crisis. Subject specialists in Mathematics and English were targeted because these subjects are regarded as problem subjects. According to (Salkind N. , Exploring Research, 2009) an interview is an exchange of ideas and information between individuals on a topic that is of interest to all parties. This method has been used to gain insight into a specific area of knowledge, that is to understand why learners are underperforming and why they are not performing as well as their international counterparts. In depth open-ended interviews were used because the researcher wanted to obtain a comprehensive and all-inclusive understanding how participants feel about education in South Africa. This is also in line with how (Creswell, et al., 2007) explains qualitative research. Educators and lecturers have been specifically targeted to ascertain how education stakeholders in secondary and tertiary education perceive the challenges facing education in South Africa.

This investigation has been augmented with a review of relevant literature pertaining to the unfortunate situation regarding education in South Africa. The literature review plays a significant role in contextualizing a study and provides information as to why we are experiencing a crisis in education in South Africa. In other words, why we are experiencing an educational slump in South Africa and where to from here to improve upon the current situation.

Findings/Analysis

In this investigation the analysis of data included reading the transcripts of the interviews, organising the information and paraphrasing to illustrate the findings in a logical manner. The researcher analysed the information from educators, then subject specialists and finally lecturers.

Educators are frustrated because many have limited resources, classes are large, learners are not motivated, communication with relevant education stakeholders is often delayed. Educators assign these communication problems to their not receiving term workshop programmes on time, principals do not collect post from district offices, which results in educators receiving information too late. The appointments of educators are delayed, academic and curriculum changes do not reach educators on time, nor are there effective implementation plans. Educators also complain that compliance gaining is another challenge that they have to deal with. Consequently, learners who do not pay attention or who are disruptive in class do not excel academically.

One of the major problems subject specialists from the DoE are grappling with is educator competence, especially in learning areas such as Mathematics and English. They have indicated that many educators are not able to assist learners because they are not adequately trained. Nor do these educators have information technology skills that could assist them to access information to improve their teaching methods. It is their view that competent educators should be able to assist learners but this is often not the case. In addition, the LOLT is also a problem because many educators are not proficient in English, which is the medium of instruction. Subject advisors indicated that they schedule cluster meetings with educators to inform them about curriculum matters and assessment but meetings are poorly attended. Many schools still do not have access to electronic mail or other advanced forms of technology.

Consequently, well-resourced schools are at an advantage because they receive information timeously. Conversely, under resourced schools have to rely on the pigeon hole system which has proved to be ineffective. Subject specialists also experience problems obtaining permission to visit schools. They are disillusioned by bureaucratic red tape that hinder them from doing their work. They are frustrated by the large number of schools' assigned to them. Consequently, they are often not able to visit schools regularly. They have also reported that communication problems include: roads that are inaccessible during rainy seasons, telephones that are not working and even network problems with schools that have internet access.

The researcher's interaction with lecturers has revealed that they believe that learners are not equipped with the necessary skills to access mainstream university programmes. One of the major problems highlighted is the medium of instruction. This coupled with the fact that many first year students are struggling with reading and writing. They have also indicated that students have difficulty comprehending prescribed texts and that their writing skills are not up not standard.

Recommendations

In order to improve education in South Africa resources for educators should be made available for them to be effective in the classroom. Large classes which is an age old problem should be reduced and more educators should be appointed to alleviate this problem. Appointments of educators should receive priority, parents, teachers and the community as well as school governing bodies should work together to create environments conducive to teaching and learning. In this way the basic problems that deter effective teaching and learning should be addressed.

The language policies at provincial and national level should be reviewed because learners should be provided with access to instruction in the language of their choice. There should be more accountability for educators who do not attend workshops or meetings arranged by subject specialists. Principals should take the lead and ensure that information from the DoE is received timeously and that educators attend these workshops. Communication between stakeholders such as educators, principals, subject specialists and circuit managers should be improved in order for it to be effective. This should enhance the quality of education that learners receive. The number of schools assigned to subject advisors should be reduced in order for them to be more effective that they are at present. This should

especially be implemented with subjects such as Mathematics and English where there is a major problem.

The researcher recommends that a link between Further Education and Training (FET) which focuses on grade 10-12 and Higher Education (HE) be established to ensure that educators and lecturers are informed about curriculum matters. All the educators who have been interviewed have indicated that they do not have profound knowledge of what is happening in the higher education sector. Similarly, lecturers have indicated that they are not acquainted with curricula in FET. Therefore, it appears as though the two groups are working in silos, which is not the ideal situation. This gap should be narrowed in order to improve the current education crisis.

Despite intervention strategies for first time entering university students, attrition rates are still too high. Students are also not completing degree and diploma courses in the allotted time frames. Collaboration between FET and HE could alleviate this problem and the gap between Grade 12 and first year university could be narrowed and more students could be successful and obtain qualifications in the prescribed time frames.

As the title of this article, *"Turning up the heat in South African education"* suggests it is time to address issues with new dynamism and vigour that will compel learners to perform to their very best. This applies to educators, subject specialists, school governing bodies, provincial and national education departments and other stakeholders directly and indirectly involved in education. More stringent measures should be implemented by provincial and national education authorities that will ensure that education stakeholders are held accountable for the success of education in South Africa. That being said, the researcher wishes to acknowledge the concerted efforts of many education stakeholders who are committed to improving the South African educational system. However, it is disconcerting to note the large number of first year students who simply drop out of university because they cannot cope, more so the number of learners at schools who do not even reach Grade 12.

This article once again reveals that the real issues such as resources, educator competence, LOLT, large classes, compliance gaining, communication, commitment and dedication are among the real issues that prevent educators, lecturers and even subject specialists from performing to the best of their ability. We are aware of these constraints but effective intervention is still lacking and should be remedied. Nor are the problems such as the medium of instruction in which learning occurs being taken seriously or addressed in a manner that fosters improvement in the educational fraternity.

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Lost in English in Higher Education

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Abstract

Despite having been taught through much of their schooling and being exposed to English in other areas, many students at the Central University of Technology display a disconcerting lack of comprehending and/or expressing themselves proficiently in English, the language of instruction. This is of huge concern since this inability to comprehend the language and express themselves in it could affect performance adversely. These learners often do not understand the text books with which they interact, nor the lecturers who address them in a language that is neither's mother tongue. With as many official languages as there are in South Africa, learners who underperform, often cite English being a difficult language as their biggest problem. The institution and lecturers who have to ensure that educational outcomes are reached have to contend with students whose competency levels are below par, while ensuring that learning occurs. If students do not comprehend what they are reading or do not understand lecturers because of an existing language barrier, how can these students be expected to perform well?

This research aims to investigate how and to what extent the Language of Teaching and Learning (LOTL) impacts learner performance and the attainment of educational outcomes. A qualitative approach, comprising face-to-face interviews with lecturers and students was followed in order to gather relevant information. Information, directly from the students would indicate the extent of this problem and what they thought could be done to facilitate their education and help them attain the envisioned learning outcomes. The results have shown that the LOTL poses a major challenge as it is many learners' second or third language and ways of addressing this challenge would be suggested.

Keywords: Language of Teaching and Learning, learner performance, educational outcomes, Central University of Technology.

Introduction

South Africa is truly a melting pot of cultures and languages, encapsulated in our constitution. Students go to school, dreaming of one day attaining a qualification from an Institution of Higher Learning, preferably a university or university of technology. McGroarty (2002) avers that educational levels often not only determine career, but also income and social prestige, thereby making higher education desirable for upward social mobility. Sometimes that remains a pipe dream, but for those who manage to get accepted it may seem like half the battle has been won. However, many of these students are ill equipped for tertiary education because of their English language abilities, which in most cases and at most universities is the only language of teaching and learning and students' second or third language. Although, English is seen as the lingua franca in South Africa, i.e. the language of economic activities,

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parliament and education (The English Academy, 2009) and a symbolic gateway to a better life (Van der Walt et al., 1998) it leaves much to be desired in higher education (HE) when the foundation is lacking and learners are unable to understand the language optimally or express themselves proficiently in it. The tertiary landscape is also constantly changing, having to make provision for many diverse students with various backgrounds and levels of linguistic abilities, especially those from rural areas.

As previously stated, English is most students' second or third language even though many of them received most of their secondary education in English. Thus, when these students enter Institutions of Higher Learning (IHL) they do so with the firm belief that they have mastered English to such an extent that they would be able to cope with the language within that environment. Unfortunately, that is not the case in many instances as the environment is different and expectations from these institutions are high. Students are expected to interact more, academically and independently with their text books, other learners and lecturers. This is when students realise that they are not prepared adequately for tertiary education. They may have passed Grade 12 and as such expect that their tertiary education would be a breeze, only to realise that their literacy competencies are not on par with institutional expectations.

Language is important since that is a tool for communication and how we make meaning and create understanding. However, since it is a second or third language it becomes a stumbling block for many as they are not as proficient in the Language of Teaching and Learning (LOTL) as they might have assumed upon leaving secondary education and enrolling for a course at an IHL. Upon entering these institutions, like the Central University of Technology, students find themselves in a lion's den, not knowing how to cope with the work, the language, the environment, the expectations or where to turn when they feel overwhelmed. Albeit, language, especially from the students' side, is not the only problem, it is an important one that affects the achievement of learner outcomes. As a result of the language issue, both the qualification attainment and student retention rates are impacted.

Literature review

The Language Policy for Higher Education Document (2001) recognises that the South African student population in higher education (HE) is linguistically diverse, with a variety of home languages represented in the student body of a single institution. Multicultural education would therefore have been the norm in an ideal world as more and more culturally diverse students with diverse linguistic abilities enter into higher education. However, at this particular point in time, we are quite far from that ideal and have to make do with English as the Language of Teaching and Learning at our Institutions of Higher Learning (IHL) for what is termed practical reasons by the abovementioned policy document.

Language is central to learning since it is the main means through which knowledge is acquired, reproduced and conveyed (Cliff, 1998). This makes the language of instruction used in institutions of the utmost importance (Mda, 2000). According to Vygotski (1978), although language is a tool for learning and an aid to understanding much time is expanded on information conveying rather than ensuring comprehension. As such, Evans and Green (2007) maintains that second language users of English are bound to experience difficulties in using it in their studies as they have not fully mastered it. Understanding and expressing themselves in that language, then often become a problem for many of our second and third language speakers of English and lecturers can also not ensure students' comprehension or address their language

issues as they have curricula to complete the curriculum within a given time. Attempts to address this challenge have been to incorporate Academic Literacy and Communication and other writing and reading courses into the core curricula to redress the shortcomings of students with regard to English writing skills. Nevertheless, that still does not address the challenge of learner interaction, comprehension of and expression with the language of teaching and learning. According to Monica (1998), there holds a relationship between language, thinking and learning which affects cognitive development and academic performance are negatively when learning is not through students' mother tongue during formal learning.

Gerber (2005) indicates that the effectiveness of communication between the lecturer and the student, between the student and the written text and the linguistic skills of the lecturer all impact student understanding and performance. With education having become more learner centred than lecture centred, much more is expected from students. They are expected to be the authors of their own destiny, thereby taking control of their own learning in collaboration with other students, lecturers and other available technology (Shale & Garrison, 1990) and rely less on lecturing and instruction. However, that in itself is asking a lot from students who lack the proper language (and other) skills, experience linguistic barriers, often fail to understand the cultural component of English and are largely influenced by social media language which exacerbates an already big problem.

Another problem identified by Rollnick (2000) in her research of language in a science classroom is that second language learners are doubly challenged and burdened as they have to acculturate and adapt to a new environment, way of expressing themselves academically, as well as mastering what is to them completely new and difficult terminology. Thus, a learner learning science through a second language is akin to becoming initiated two social practices as once (Rollnick, 2000). This situation holds true for other subjects and fields as well. Cummins (1996) holds a similar view and argues that many second language learners are given a possibly unreasonably challenging task of having to succeed with little contextual support and limitations in language abilities. This is when language becomes an obstacle to understanding or expressing what they know. Burke and Wyatt-Smith quote a non-mother tongue speaker of English that the difficulty with expressing himself in English was not that he did not understand the content but that he found it difficult to put what he wanted to say into words so that the writing in English flowed.

All the language skills are important, but writing presents the hugest stumbling block as being able to write academically is key in the academic field in order to achieve academic success and to demonstrate that achievement (Leki & Carson, 1994). According to Storch (2009), academic writing subsumes reading and synthesising of information from various sources then producing new text that is academically well written and shows understanding. For Rollnick (2000), academic writing is also the crux of the problem as she indicates that verbal expression comes far more easily for second language users than academic writing at tertiary level.

Research design

Methodology and research design direct the researcher in planning and implementing the study in a way that is most likely to achieve the intended goal. It is therefore a blueprint for conducting the study. The next section gives an overview of the methodology to be used in this study. In order to answer the research question, the researcher will make use of a qualitative research design. Qualitative research is mainly exploratory research that emphasises

understanding (Wyse, 2011), provides a touch of real life in its many disparities, and gives a better understanding of the thinking and feelings that inspire or motivate people to take action. Qualitative research is therefore used in an attempt to understand the fundamental reasons, feelings and motivations of a group of people. Therefore, it aims to explain, understand, explore, discover, and clarify the situations, feelings, perceptions, attitudes, beliefs and experiences of a group of people. According to McMillan & Schumacher (1993), qualitative research that involves interviews with open-ended questions allows a researcher to understand how individuals perceive their world and how they explain or make sense of important events in their lives.

Although there are many possible ways to gather information from participants about a research problem this study, however, used semi-structured face-to-face interviews with Language Practice first and third-year students as well as some of their lecturers at the Central University of Technology in order to explore the problem at hand. A qualitative design, using semi-structured face-to-face interviews was chosen because it enabled verbal social interaction with participants and the researcher felt that responses would be best obtained when participants are interviewed in their natural setting. The following is cited by Bless and Higson-Smith (2000:104-109) as the advantages of qualitative interviews:

• actively involve the respondents in the research process, thereby empowering them.

• allow free interaction between the interviewer and the interviewee and opportunities for clarification of data.

• maximise description and discovery by affording people the opportunity to express their ideas, thoughts and memories in their own words, rather than those of the researcher.

Findings

In this section, the research findings, from the data collected, are presented. As previously stated, data was obtained through semi-structured interviews with Language practice first and third-year students and some of the lecturers. These students were selected because they are selected and accepted into this programme because of their linguistic abilities or language proficiency. Findings reveal that although these students are expected to be quite proficient in the Language of Teaching and Learning, they felt that they were lacking some skills in expressing themselves academically and understanding the technical language used in their text books. Although they receive most of their secondary education in English, they feel that school and the English used there did not prepare them adequately for tertiary education. They expressed the view that prior to entering an Institution of Higher Education they thought that they knew English but now realise that they actually have a rudimentary knowledge of the language. They often feel overwhelmed and cannot always follow in class or when they read as they first translate what they hear and read mentally into their mother-tongue or first language before they interpret the information in English. Very few indicated that that was not the case with them and regarded themselves as fully bilingual. Regardless, majority of them indicated that they would cope even harder with c in their mother-tongue or first language as they are used to English and their textbooks are in English.

Recommendations

It is a grave concern that students feel they are ill equipped with the Language of Teaching and Learning and that they often feel overwhelmed to the extent that they think of quitting their studies.

From the above findings, it is recommended that learners be exposed more to academic texts and that they interact with peers who are bilingual or proficient in the language. Notes could also be made available to students in both English and their mother-tongue, and informal groups established to assist them when they are really overwhelmed. As they often understand spoken text better than written text, audio material or books could also be made available. In addition, terminology lists and explanations or equivalents in the mother-tongue could be provided.

In conclusion, there is no short-term solution to this problem as it should ideally be addressed prior to learners entering Higher Education. However, once they do enter they should be helped as much as humanly possible. The researcher also recommends that this should be dealt with at the level of government and legislation affording it the same status as SET.

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